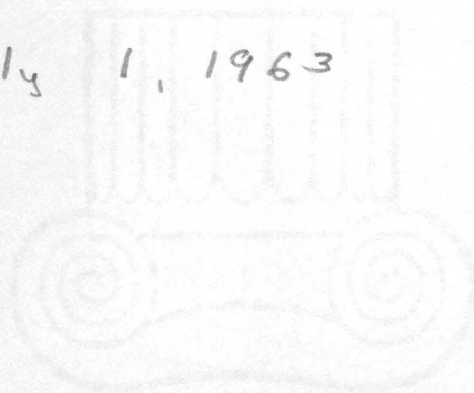


YOND FREE
SEA COLLECTION
ENTLE

July 1, 1963



WYBE

1. VISIT OF NASA HEADQUARTERS PERSONNEL

On Wednesday, June 26, 1963, Capt. Robert F. Freitag and Messers. William E. Lilly, George M. Low, Rodolfo A. Diaz of NASA Headquarters visited Michoud Operations to receive a general orientation and tour of the facilities. Particular interest was expressed by these individuals in the area of construction of facilities. The following individuals accompanied the headquarters personnel, Mr. David H. Newby, Capt. William C. Fortune, Col. Lee B. James, Messers. R. E. Lindstrom and M. W. Urlaub. ✓

* *gem* 2. PERSONNEL STRENGTH

There are a total of 7,168 personnel of NASA prime contractors and MSFC/Michoud Operations employed in the Greater New Orleans Area.

The Boeing Company	3,609
Chrysler Corporation	2,622
Mason-Rust	663
NASA	208
Rocketdyne	9
Telecomputing Services	57 ✓

3. INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS (IBW) AND NEW ORLEANS ELECTRICAL CONTRACTORS ASSOCIATION

Approximately 69 electricians are not working due to the expiration of their collective bargaining agreement with the New Orleans Electrical Contractors Association. It is expected that negotiations will resume and a new agreement will be reached within a day or two. The impact at Michoud is very slight. ✓

B-7/3

NOTES 7/1/63 DAVIS

- * 1. Work at Mississippi Test Facility: Contract negotiations were completed with General Electric for activation of MTF work. This includes plant support, test support, personnel relocation, assuming guard service, food service, etc. Contrary to Headquarters' prediction, the terms, conditions, and fee agreed upon are reasonable. Amount of award is \$2,393,500. ✓
2. Close of FY 63: The volume of work processed and the amount of funds obligated are proof positive of successful close-of-year procurement activity. Opening of FY 64 will probably require two weeks of diligent and concentrated effort. ✓
- * 3. S-IV and S-IVB Programs: This office has observed a significant decline in the Douglas performance for S-IV and S-IVB, both technically and managerially. Headquarters, NASA, agrees with this conclusion. Perhaps Douglas is neglecting these two programs while placing too much priority on their proposed movement to Huntington Beach. This report is for information only. Action will follow as a part of upcoming negotiation for \$70 to \$80 Million contract adjustment. ✓

*
gan

1. GE Negotiations: Negotiations were completed last Friday on the GE Test and Plant Support Contract for MTO. The contract is for an estimated cost of \$2,334,500 plus a fee of \$115,500. A teletype was sent to GE last Saturday to permit them to incur cost and commence work. In line with this, there will be a meeting in the near future with Messrs. Shettler and Eaton of GE, Mr. Gorman and myself. ✓

2. Bart Slattery's Retirement: Mack Herring represented me at the retirement ceremony yesterday at the Naval Air Station, Marietta, Georgia. We expect to have a news release on the event available soon. ✓

WF

Next time you're in Huntsville, I would appreciate your giving me a rundown on the agreements reached and on your meetings op. and with Eaton for next few months.

(I'm so sorry that we couldn't meet before you left for permanent change of station to MTO. My schedule was completely filled after I came back from Paris. Postponed is not forgotten!! B

- *1. Mission Control Operations Panel: The third meeting of the Mission Control Operations Panel (MCOP) took place at LOC on June 26, 1963. Agreement was reached on (1) A non-operational facsimile link with voice capability will be shortly established among Mission Control operation elements of LOC, MSC, and MSFC. (2) Preparation, approval, and submission procedures for Instrumentation Requirements Documentation were established. Since GSFC and OMSF were represented in the meeting, it can be expected that the new Headquarters Working Group for Communication and Instrumentation will accept our proposal. This item turned out to be very complex and difficult to solve because of the unusual number of organizations involved. ✓
- *2. Flight Mechanics Dynamics and Control Coordination Panel: Action items and agreements reached at the 5th meeting of this panel were reported in Notes 5/27/63 Geissler. The only change in the information reported therein is that the question of LES jettison times for Saturn I after S-IV ignition, Saturn IB after S-IVB ignition and Saturn V after S-II ignition is still open. The subject is being re-examined by MSFC and MSC, and agreement is expected shortly. ✓
3. S-VI Voyager Study System Review: Subject review will be held with JPL and OSS on July 9, 1963, to discuss present status of investigation. An internal orientation meeting to streamline and unify our position will be held July 1. These meeting announcements are mainly for your information. It is not imperative that you attend either of them. ✓
4. S-IC High Altitude Base Heating Tests: After experiencing some heating problems due to high chamber pressures, the S-IC high altitude base heating program is approximately 85 percent complete. Preliminary results agree reasonably well with our earlier predictions. Anticipated completion date is July 3, 1963. The model will then be shipped to Lewis Research Center for testing in the high supersonic regime ($M=.8$ to $M=3.5$). The program is essentially back on schedule. ✓
5. FPS-16 Radar/Spherical Balloon Program: This system is the only operational non-optically dependent detailed wind measurement system available. Past theoretical aerodynamic analysis showed the balloon response characteristics to be within the tracking "noise" of the FPS-16. Recent tests show that motions of the balloon, caused by aerodynamic effects, are induced at wavelengths less than approximately 200 meters. Previously this motion was attributed to atmospheric turbulence. A series of runs will be made on July 5 at Cape Canaveral, using different sizes and shapes of balloons. The purpose of this study is to improve the design of the balloon to minimize the aerodynamically induced errors. Marshall and Langley are both working on this problem. Previously we thought that the FPS-16 Radar/Spherical Balloon method would give accurate data down to approximately 75 meters wave length. Now, this does not appear to be possible with the current balloon configuration. Smoke trail photographic measurements (another wind measurement system) are also difficult to evaluate. There is no simple solution to the wind measurement problem and increased efforts will be made to investigate promising techniques. ✓

B 7/13

1. S-I-5: A special examination of the condition of the Gox standpipe screen weldment, located inside the 105" tank of the S-I-5 was conducted and it was found to be extensively cracked, indicating an embrittled condition. This division recommended replacement and corrective action is under way to replace the screen. ✓

* 2. S-IV-5: The S-IV-5 vehicle is on the test stand at Sacramento where static firing was scheduled on June 27, 1963; however, the static firing is tentatively rescheduled for July 10, 1963 due to incomplete assembly. ✓

3. S-I-7: Pressure testing of the S-I-7 Stage is continuing in the Quality Assurance Division. Pressure testing has been completed on the fuel tanks, engine control, turbine exhaust and gearcase systems. The Gox system is complete with the exception of the Gox flow control valve which has not been installed. The remaining mechanical systems are approximately 90% complete. ✓

* 4. S-II: A proposal for reorientation of stage checkout facilities at Seal Beach has gone to the Saturn Systems Office. Shortcomings of the present plan are that use of the assembly, test, and checkout stations in sequence is based on a success schedule, i.e. any delay arising in any one area will block the flow of vehicles and cause delays everywhere. In addition, electromagnetic interference problems are to be expected in performing final stage checkout in the immediate vicinity of manufacturing operations. The submitted proposal would eliminate these problems but it requires some additional funding which, I understand, makes the proposal not feasible at this time. However, implementation of a modification at a later time will be even more costly, and time-consuming on top of it. This is just one item contributing to the problem of unforeseen expenditures which you discussed in last Friday's meeting.

5. RL-10 PROGRAM: Engine S/N 1801 was received from Sacramento for disassembly. The Quality Assurance Division performed part of the disassembly by removing the Lox pump. The engine was then moved into Building 4705 for the remainder of the disassembly. All components and parts will be inspected either visually or dimensionally. A report of the engine disassembly and analysis will be forthcoming. ✓

6. MANNED SPACECRAFT CENTER SOLDERING SCHOOL: The Quality Assurance Division has been asked by the Manned Spacecraft Center to send an instructor to approve its soldering school and training methods to MSFC-PROC-158B. MSC has also approached this Division to cover its contracts in the Huntsville area for electrical in-process inspection; in turn, MSC agreed to cover MSFC contracts in the Houston area. ✓

7. TRAINING: The Army Ordnance (New York District) requested that MSFC train 16 newly employed inspectors for the Bendix contract on ST-124 guidance platforms. The Quality Assurance Division will send instructors to train these people to MSFC-PROC-158A (Soldering Specification) at the Bendix facilities while the company is on vacation during the period July 1 thru 13. ✓

J.5
Request
a little
more
detail
B

NOTES 7-1-63 GRUENE

B 7-3

1. S-I Stage, SA-D5: The S-I stage of SA-D5 departed Cape Canaveral, 11:00 a. m., July 1, 1963 after successful completion of the wet test program. ✓

*
gm 2. Accessibility of Upper Stages and Upper Stages' Engines: On our last trip to the West Coast, we became aware of a serious problem concerning accessibility for servicing upper stages and upper stages' engines. A group will be formed consisting of LVO personnel concerned, P&VE and M-SAT representatives. This group will go to NAA and DAC to investigate problems and possibly propose design changes. NAA requested a delay of approximately 4 weeks for this visit. Mr. Weidner is informed. ✓

*
gm 3. Destruct System for Saturn Vehicles: A new look is being taken at the design of the destruct system for Saturn vehicles. P&VE representatives have planned a visit to LVO this week. The Range will be contacted on this subject by the combined LVO-P&VE group. ✓

*1. S-IV-D STAGE HYDRAULIC CHECK VALVE. A check valve on the S-IV-D stage hydraulic manifold ruptured during current gimbaling tests on the dynamic stand. This is the third check valve of this type to rupture. There are 30 check valves of this type in the DAC S-IV hydraulic system. M-P&VE, M-ASTR, and DAC personnel are investigating to determine the cause of these failures. ✓

*2. S-IV-D ACTUATORS. During our laboratory gimbaling test, the shaft on one of the actuator feedback potentiometers of DAC actuators jammed and bent. The potentiometers on this actuator are external to the actuator presently planned for the S-IV-5 and S-IV-6 flights. Since we objected to this design more than 15 months ago, we introduced a new actuator from Moog. In agreement with Dr. Rees and Mr. Heimburg, we now order DAC to use the new Moog actuator, delayed by DAC to S-IV-7 and following, also for S-IV-5 and -6 flights. ✓

3. ACCELERATION DATA FOR BELL COMM. A magnetic tape containing acceleration data on Saturn V has been made and was forwarded on Thursday to Mr. Farbanish of Bell Comm in Washington in accordance with his request. ✓

4. A VEHICLE INSTRUMENTATION WORKING GROUP SPLINTER MEETING was held with Douglas Aircraft (S-IVB) on June 13, 1963 at MSFC to clarify approval dates for the SA-201 and SA-503 Instrumentation Program (S-IVB). Full agreement was reached on dates and mechanics for submittal and approval. ✓

*5. THREE SEPARATE VEHICLE INSTRUMENTATION WORKING GROUP MEETINGS were held with the Boeing Company, Douglas Aircraft Company, and S&ID, North American Aviation, on June 25, 26 and 27, 1963 at MSFC, Subject: Implementation of MSFC Furnished Design Information on Telemetry Equipment by Individual Stage Contractors. Contractors presented their telemetry system approaches utilizing MSFC design information. Agreements were reached on: 1) completeness of furnished documentation, 2) schedules, 3) procurement specification format, and 4) suggested vendors for telemetry equipment.

6. PRESENTATION TO NASA HQS. ON SATURN IB/V ASTRIONICS SYSTEM. At the request of Saturn Systems Office, Major Seltzer (M-ASTR-S) presented a brief description of the Saturn IB/V Astrionics System and a description (followed by a discussion) of the MSFC concept for Saturn/Apollo Orbital Operations on June 27, 1963 at Hqs, NASA. In attendance were ten representatives of both Captain Freitag's office and Dr. Shea's office (including two Bell Comm representatives). A copy of an internal note describing this concept as presented to the attendees is attached. ✓

7. EXTENDED FLIGHT SIMULATION LABORATORY PROJECT. Reference Notes 6/10/63, Hoelzer, Item #1 (copy attached). Dr. Hoelzer was concerned over the delay in installation of the Celestial Body Motion Simulator under ASTR direction. A contract was signed on 11/7/62 for fabrication of this simulator by the R.E. Atckison Co. In March 1963, the Atckison Co. was closed by the Internal Revenue Service for back taxes which resulted in termination of our contract. All hardware, drawings, and tooling were shipped to MSFC with the total project about 60% complete. Since receipt, this material is being evaluated. We estimate that completion of this project will still require at least 5000 man hours which must be contracted. Our workload and manpower situations demand that we consider this project as a secondary priority item (see also Item 3 of Notes of 4/22/63).

→ Bill Davis
Why did we not find out ahead of time that this company was in trouble? What safeguards against such cases do we provide? B

With
Request
more
details
(3
pages
or so)
B

NOTES 7/1/63 HEIMBURG

B7/6

*1. S-IV-5, DAC/SACTO: Electrical GSE checked out. No power has been supplied to the stage. Stage electrical, instrumentation, and gimbal checkouts to start this week. Date of first firing now planned week of 7/15. ✓

2. SOUND SUPPRESSION TEST STAND: Minor stand modifications were made last week. Four initiators were fired inside the suppressor to determine the natural frequency. The next firing is planned for 10 seconds, Tuesday, 7/2. ✓

3. FACILITIES: The first "pour" of concrete (1410 cubic yards) was made Saturday, 7/29, on the foundations of the advanced Saturn Dynamic Test Stand. It required 20 hours to complete the "pour." ✓

4. BLOCK II HOLDDOWN ARMS: After repair of the second set of Block II holddown arms by Hayes (Birmingham), a pivot pin for the upper arm linkage broke during reassembly, apparently due to a material defect. It was sent to P&VE Materials Lab for inspection. A material analysis revealed that the apparent cause of failure was due to brittleness (heat-treat problem). The pin could not be checked radiographically due to configuration. ✓

The Materials Lab recommends use of 17-4 PH stainless steel because of better heat-treat characteristics. ✓

LOC is having 24 new pins fabricated, using 17-4 PH stainless steel material. Test Division will load test the new pins, utilizing the second set of the Block II arms which are now installed on the test pad. All arms will be equipped with the new type pins. ✓

*5. MTF WORKING GROUP: Aetron contract for MTF Phase I technical systems approved by NASA Headquarters, 6/29, subject to two minor conditions which are currently being negotiated with Aetron by Procurement and Contracts. Notification to proceed anticipated this week. ✓

We are awaiting approval of MSFC nominations for proposed MTF Cryogenics Plant Evaluation Board submitted to Dr. Seaman's office last week. ✓

Contract NAS8-5620 with Martin-Denver for future large launch vehicle test facility study finalized today. ✓

B 7/6

- *1. SLIDELL ANALOG COMPUTER INSTALLATION: Utilization of the analog facility at Slidell by Boeing continues to be less than 25% of their projections. The computer time available at Slidell is being utilized by Chrysler and by overflow from Computation Division. All of Boeing's requirements for analog computer support in Huntsville are being supplied by the Computation Division. In spite of this situation, Boeing is obtaining bids from computer manufacturers on an analog installation which would essentially duplicate the Slidell facility in Huntsville.

Do. Lange
Please clarify this with Boeing and stop the nonsense
B

2. TR-48 INSTALLATION FOR AEROBALLISTICS DIVISION: Two Electronic Associates TR-48 transistorized analog computers have been received. These two computers are to be installed in Building 4200 to expand the decentralized analog facility in the Dynamics Analysis Branch of Aeroballistics Division. ✓
3. INFORMATION STORAGE AND RETRIEVAL: The Computation Division, through a work order from the Redstone Scientific Information Center (the joint Army-NASA Library) is carrying on a project to apply certain library administrative and information storage and retrieval problems to computers. This project, along with other scientific information work at Redstone and Marshall, was reviewed on June 27th by Mr. W. M. Carlson, Director, DOD Scientific & Technical Information Office and Mr. P. N. Vlannes, Deputy Director, Army Research Office. The GE-Computation Division project and presentation were very well received. Mr. Vlannes was sufficiently impressed with the head of the four-man project to offer him a position at GS-15 in Washington as head of a particular information project proposed there. The man has chosen to stay with GE in the Computation Division and suggested to Mr. Vlannes that the Army subcontract the work to the Marshall Computation Division. ✓

B 7/6

1. LUNAR LOGISTICS ACTIVITIES: I, with other members of this office, participated in the MSFC tour of Air Force facilities at Wright-Patterson and Hanscom Air Force Bases on Monday and Tuesday. A consolidated trip report is being prepared to cover these activities. The assignment of research tasks in our field of interest to the Air Force could become quite involved considering indications by the individual Air Force groups of the requirements for build-up of manpower and facilities to support such tasks.

Accordingly, the cost of performing such tasks with the Air Force instead of industry is not necessarily lower. We will pursue the matter further.

Comments on the Headquarters "Lunar Construction" study by the Corps of Engineers are in preparation, including a proposed test plan for the Apollo Logistics Support Systems (ALSS) and associated facility requirements.

Major T. C. Evans of OMSF will be here for a discussion of the ALSS program on Wednesday, July 3. ✓

*2. SATURN 1-B THIRD STAGE PROGRAM REVIEW: Meetings have been scheduled at MSFC to review program status of the Marshall in-house S-VI stage and the STL study contract on the Centaur configuration. The S-VI review will be held on Tuesday, July 9, and the Centaur review is scheduled for Wednesday, July 10. Personnel from NASA Headquarters and JPL will attend the meetings to discuss status and problems with the Marshall divisions. ✓

H.H.

This is
precisely
what
NASA Hq.
is determined
not to
support.
B

1. COST ESTIMATING

I felt encouraged by your words, during the last Board Meeting, to summarize my thoughts on this subject and develop a 20-point proposal for you. This memo is now in the typewriter and will reach you within 24 hours. Distribution will also be made to all Board members. ✓

2. FY 63 CONTRACT STUDY PROGRAM SUMMARY

As today is July 1, it appears proper to summarize our contract activities during the past fiscal year. The two tables below list a summary of FY 63 dollars obligated by FPO for future project studies:

<u>By Program Area:</u>	<u>\$ x 10³</u>
Operations Analysis	352
Launch Vehicles	2103
NOVA	3500
Orbital Systems	380
Lunar Systems	388
Planetary Systems	687
Total	<u>7410</u>

By Contractor:

General Dynamics	2373
Martin	1705
Lockheed	784
Chance Vought	563
Boeing	498
Douglas	470
Space Technology Lab.	331
North American Aviation	250
RAND Corporation	135
Other	301
Total	<u>7410</u> ✓

Of the funds authorized for advanced studies, 99.5% were obligated by FPO. This resulted in 30 study contracts in 20 project areas. A reserve of \$27,000 was kept for overruns. ✓

All actions have been completed by P&C and the contracts have been signed or mailed for signature. We are entering FY 1964 without a backlog of FY 1963 contracting activities. We expect an increased "business volume" for FY 1964. ✓

* 1. Saturn V, S-II Stage: The fifth Manufacturing Engineering Working Group Meeting was held here in Huntsville on June 25, 26 and 27. Participants included 3 people from DAC, 4 people from Lockheed, and Mr. A. T. Diamond from OMSF. Mr. W. Parker from S&ID attended the meeting on the first day. Some of the important agenda items were: Discussions on the bonding process of the common bulkhead and the certification of the autoclave, detail discussions on welding techniques included planishing of welds, and the feasibility of fabrication and inherent problems of the strip seal design as a back-up for the common bulkhead. The Composite Structures Panel concurs with the ME recommendation to proceed into a hardware program on this design. [The following actions are recommended: (a) Request detail manufacturing plan, tool design, and schedules from S&ID, (b) Authorize new tool construction to proceed immediately, subject to ME review, (c) Authorize fabrication of five sets of all minor parts, peculiar to this design, (d) Authorize fabrication of two sets of forward gores, (e) Authorize fabrication of two "J" Ring sub-assemblies, (f) Authorize assembly of one complete common bulkhead of this strip seal design on a non-interference basis with S&ID's prime effort.] ✓

2. Saturn V, S-IC Stage:

a. We succeeded in welding the first two skin panels for the Fuel Test Container with only four minor porosity repairs required. This is a one pass vertical weld with soft (vacuum) clamping without back-up bar, what we call "free state" welding. It might be of interest that the cost of each quarter segment panel is approximately \$20,000. ✓

b. The Parsons Company, under subcontract to Arrowhead, has successfully manufactured a one piece (without weld) lox suction duct. This part starting as a stainless steel, type 321, forged billet 66 inches long, has been extruded to a 40 feet long section, 20 inches in diameter with a .080 inch wall thickness. Preliminary inspection indicates that all drawing requirements have been met. ✓✓

3. Engineering Change Control: The present change control procedure at MSFC is not very effective. There are hundreds of cases where changes have been incorporated into components and final assemblies in the S-I and S-IC stages without approval by the Configuration Control Board. In a great number of cases this Control Board is only pushing the paper after the fact. My problem is: Shall I continue to operate this way, i.e. initiate changes on hardware based on verbal agreements with design engineers or shall I stop work at sub-contractors, at Wichita, and in our shops when changes are pending and wait for written authorization? In the latter case we can completely forget our schedule commitments.

Silly Misazek

What are your views on this subject? B
(Please, don't consider this a criticism of P&VE, But what policy do you recommend?)

- *1. SATURN I/IB: SA-5 - After post inspection and analysis of the GOX diffuser screen, it was found necessary to replace the screen. Shipment of S-I-5 will not be before 7-17-63. ✓

Present checkout requirements of S-IV-5 indicate the SACTO acceptance firing can be accomplished on 7-19-63 as the most probable date. ✓

2. SATURN V: Re Notes 6-10-63 Kuers (Attach 1.) - Present status of bulkhead backup program, see Attach. 2.

S-II - On 3-18-63, MSFC requested OMSF to expedite congressional approval of \$2.5M reprogramming action from the R&D contract to support the facility overrun under contract NAS7-90. This \$2.5M was required to support the \$1.4M facility overrun at Seal Beach facility and \$1.1M overrun at Santa Susana facility. Since formal approval of this total reprogramming action has not yet been received and because of the end of FY 1963, immediate action was inaugurated to negate the proposed reprogramming action so that the \$2.5M could be applied to the current R&D effort. The \$1.4M funding deficit at Seal Beach will be held in abeyance until FY 1964 and will be funded during that fiscal year. FEO has received funds and authority in the amount of \$1.1M required for Santa Susana and the funds have been forwarded to the contractor. Mr. Lingle and MSFC personnel will visit the contractor facility on 7-1-63 to discuss procurement problems associated with the contractor's Seal Beach facility and the program impact should the construction of these facilities be delayed 45 to 60 days as a result of competitive procurement.

The contractor has completely re-vamped all of the PERT networks and has introduced all known engineering changes documented to date. Informal information indicates that the current negative slack value is 44 weeks in lieu of 15.4 weeks of negative slack reported as of May 15, 1963, under the old network system. This excessive negative slack value will be pursued with the contractor in great detail in the immediate future. ✓

Captain Freitag and Mr. Gross (OMSF) will visit the contractor facility on 7-18-63 for general orientation. ✓

NOTES 7-1-63 MAUS

B 7/6

1. JULY PROGRAM STATUS REVIEW - The next OMSF Program Status Review is scheduled for July 25 - 26. It is planned that MSFC project managers will make the presentations to Mr. Holmes. ✓

The July scheduling submission must reach OMSF by July 22, and is to include funding and manpower figures which reflect as nearly as possible year-end status as of June 30. ✓

A separate review of the Apollo Spacecraft Schedules is to be held on July 22. ✓

In addition to the usual early coordination with OMSF staff personnel, Captain Freitag plans a full review and dry run on or about July 23. ✓

Included in the agenda of this review will be approximately a 15 minute coverage of the Liquid Hydrogen Technology effort. ✓

2. FY 65 C OF F PRELIMINARY REVIEW - The review last week by Norman Crone and John Pollak from OMSF eliminated the need for Captain Freitag and Bill Lilly's preliminary review which was scheduled for July 9 - 10. ✓

The mock congressional hearings on MSFC FY 65 C of F projects are still scheduled to be held here July 31 - Aug 2. ✓

- * 3. VISITS TO AIR FORCE RESEARCH INSTALLATIONS - The tour of Air Force Research Installations by MSFC representatives was completed June 25. As result of this, and in cooperation with Dr. Stuhlinger's organization, the research tasks for possible accomplishment by the Air Force, are being enumerated and defined. We plan to have this listing compiled by July 15 for review and selection prior to discussions with the Air Force. ✓

The visit by OMSF representatives to Air Force Systems Command research installations is scheduled for July 15 - 18. Personnel making the trip will be Messrs. Low, Freitag, Smolensky, Lilly, Diaz, Holcomb, and Crone.

→ H.M.

Please see me on this prior to my Annual Leave commencing 15 July R

B-7/6

1. SA-5 GOX DISTRIBUTION SCREEN REPLACEMENT: The Engineering Materials Branch examined GOX distribution screens from SA-6, SA-9, and a structural test tank, after failure occurred in the screen on SA-6. Based on the results of these examinations, the screen in SA-5 was inspected (6-25-63) for cracks; several cracked wires were found. A new screen, which is being procured from Chance-Vought, was scheduled to arrive at MSFC on 6-29-63. After a critical examination, the new screen will be installed on SA-5 before it is shipped to the Atlantic Missile Range. The screens appear to have failed because of a lack of control in processing techniques by the vendor. Corrective action has been taken. ✓

* 2. S-IV COMMON BULKHEAD WELD FAILURES: The Engineering Materials Branch ^{pm} has initiated a program to investigate the recent weld failures in the S-IV common bulkhead. Primary emphasis is being placed on metallurgical factors with respect to the selection of filler metal and micro-shrinkage in 2014-T6 weldments. ✓

3. POST TEST INSPECTION OF DOUGLAS AIRCRAFT COMPANY S-IV DYNAMICS VEHICLE: The following hydrogen tank deficiencies were found:

a. Two wrinkles, 3/16-inch high and 1/2- to 3/4-inch wide at the base, were found in the common bulkhead. The shortest wrinkle was about 40 inches. The growler checks indicated point debonding at top of wrinkles. ✓
The remaining portion of the bulkhead was sound. ✓

b. Ultrasonic inspection revealed several small areas in which the insulation had debonded from the tank; the largest area was approximately four inches by seven inches. ✓

c. Visual inspection revealed a few random cracks in the fiberglass lines. A fiberglass doubler near the cold helium spheres was pulled away from the insulation. No insulation damage was noted. ✓

4. RIFT CONTRACT NEGOTIATIONS: Negotiations with Lockheed for the FY-64 contract are still stalled because of fee. ✓

5. ROVER PROGRAM SCHEDULE: In a memorandum, dated 6-25-63, to Col. Fellows, Nuclear Vehicle Projects Office, Mr. Finger forwarded preliminary ROVER program scheduling guidelines and requested MSFC inputs regarding milestones so that he could establish an official integrated planning schedule for the ROVER program. It is somewhat significant that Mr. Finger's official go-ahead date is to be assumed as of October, 1964. This date is consistent with RIFT go-ahead based purely on funding limitations. It is also significant that this scheduling exercise is limited to government participation and the contractors are specifically excluded. There is, therefore, no attempt to establish the contractor meeting which we proposed to Dr. Seamans on 4-25-63. ✓

NOTES 7-1-63 Rudolph

B 7/6

No Notes. Nothing happening? Aug-1

S-II Facility: The Vertical Assembly Building located at Seal Beach was estimated by the architect-engineer, Holmes and Narver, at \$3.9M. Program documents were sent to Washington March 18, requesting authorization up to \$4.4M. To meet the schedules imposed by S&ID the Navy chose to negotiate a contract with the Murray Shiff Company who at the present is the only prime contractor performing work at Seal Beach. The Shiff proposal was received by the Navy on June 19 for \$6.1M. As Mr. Webb had not signed the reprogramming request of March 18 for \$4.4M, Headquarters was immediately advised to preclude Mr. Webb notifying Congress for an amount of \$4.4M, one day and the following day return with a higher cost figure

In view of Mr. Webb's reluctance to negotiate construction contracts, and the high cost of expediting construction of the facility, the S&ID schedules have been reviewed by Saturn Systems and S&ID to reconsider competitive advertising. It appears that if, after redirection by MSFC, the Navy can advertise and effect a contract before August 20, (which is 60 days beyond the original notice to proceed schedule of June 21, 1963) the impact on the program schedules are estimated to be:

Structural Static Test Vehicle delayed 4 weeks
All Systems Test Vehicle delayed 3 weeks
Schedule impact on Vehible 501, cannot be determined
Delivery of 502 to Mississippi Test Operation delayed approximately 2 weeks

Before Mr. Webb signs the necessary paper work to notify Congress to give Marshall authority to proceed with the contract effort, Mr. Walter Lingle and Mr. Long of the Headquarters Staff are being briefed on the S-II Facilities problems by Mr. Bowden and Mr. Shepherd at Downey and Seal Beach today. They will be advised of corrective action being taken concerning the S-II Vertical Assembly Building at Seal Beach. Upon completion of the briefing and Mr. Lingle's report, Mr. Webb will be in a position to process the necessary paper work to Congress.

→ Sheep

In view of the expected Congressional cuts for R&D in FY 64 I'm in favor of accepting these construction delays, because there will be other program delays, anyhow! B

B-2/6

NOTES 7-1-63 Stuhlinger

1. LAUNCH VEHICLE SUPPORTING TECHNOLOGY PROGRAM:

A revised FY-64 Launch Vehicle Supporting Technology Program budget guideline has been received from OMSF. This guideline totals \$13.2M, which is a reduction of \$2M from the previous guideline. The MSFC program has been revised to conform to this guideline. ✓

2. AIR FORCE CENTER VISITS: The Air Medical School in San Antonio, Wright-Patterson Air Force Base in Dayton, and the Air Force Cambridge Research Laboratories were visited by members of MSFC. Research work of high quality is underway at these centers. It appears that a number of research tasks which are of interest to MSFC could be carried out by Air Force scientists. ✓ A list of such tasks is presently being collected by RPD; it will be submitted to the Air Force (Major Peters) by Captain Bollinger of Central Planning Office. ✓

3. METEOROID MEASUREMENT SATELLITE PROJECT: The status of the Fairchild Stratos Corporation contract was reviewed in a full day meeting at MSFC on June 26. While the contract is generally in a satisfactory condition, a few problem areas do exist, such as the bonding of electrical leads to the aluminum layers of the sensors. Solutions for all presently existing problems are in sight. ✓✓

Ernst St.

See my
remarks
on Huebner's
NOTES

Dated

7-1-63

B

B 7/6

1. F-1 ENGINE SYSTEM TESTING: Two of four tests conducted were for scheduled duration. One test was terminated by an instrumentation error, and one was terminated by rough combustion cutoff (RCC) after being bombed by a 13.5-grain bomb mounted off-center on the injector. Extensive tube cracks occurred on the latter test (engine 011). An uncooled gas generator combustion body was successfully tested on two of the above tests.

Testing on Test Stand 1B at Edwards Air Force Base has been suspended for approximately three weeks for the installation of a new flame deflector. ✓

2. F-1 INJECTOR TESTS: Seven chamber-only tests were conducted, three with a tubular wall chamber, and four with a solid wall chamber and a 5U 25-compartment baffle injector with radially aligned orifices (wagon wheel). During one tubular wall test with a 5U baffle injector without decoupling, a center-mounted 13.5-grain bomb induced instability with RCC, however, it damped 10 milliseconds before main LOX valve left the open position. Two tubular wall tests were conducted with a 5U baffle injector with full decoupling and 13.5-grain center-mounted bombs induced instability with RCC. Two of the solid wall tests bombed with 13.5-grain center-mounted bombs induced instability with RCC. Severe injector erosion occurred on the first test. Two of the solid wall tests bombed with 13.5-grain bombs mounted off-center resulted in one bomb being ignited during shut-down thereby inducing instability, and the other bomb being blown out prior to bomb ignition. *Conclusion ??? gen*

H.W.

???

B

*3. RL10 ENGINE: The liquid hydrogen Air Force plant no. 74 in West Palm Beach, Florida, has been inoperative since 6-17-63. It was scheduled to "come on line" on 6-25-63, but another leak developed in the cold box. It is anticipated that the plant will resume production on 7-8-63. In the interim, propellants have been obtained from the west coast and will continue to be shipped from there until the Florida plant becomes operative. The Florida test operations have not been unduly affected by this condition. ✓

*4. H-1 ENGINE: Testing this report period has been primarily concentrated on development items such as the stainless steel thrust chamber, improved Mark III-H turbopump, improved injector, and heat exchanger. ✓

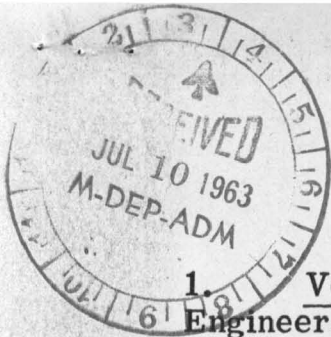
A total of 15 H-1 engine tests, scheduled for a total of 2,700 seconds, have been lost to date because of the LOX shortage at Santa Susana. ✓

5. FACILITIES: The supplemental agreement to contract NAS8-5609(F), appendix 5D, for production machine tools has been approved by the Office of Manned Space Flight, and is now in the office of the Director of Procurement and Supply Division at NASA Headquarters for approval. These are fiscal year 1963 and R&D funds in the amount of \$1,000,750. ✓

6. CONTRACTOR MANAGEMENT: In order to make use of all observations and experiences of your people in the field towards the improvement of our management of MSFC's large contracts, you might want to write an open letter to your involved personnel inviting their comments for a coordinated evaluation.

Sounds good! gen

Mac Very good idea. Please draft one!
B



Simon

NOTES TO HOLMES 7-9-63 DEBUS

1. Vertical Assembly Building. The Jacksonville Corps of Engineers received bids 2 July 63 for the VAB foundations and structural steel. Seven bids were received for the foundations contract. Apparent low bidder was Blount Brothers from Montgomery, Alabama, with a bid of \$8, 069, 000. (M); Government estimate was \$12, 723, 960. Four bids were received for the structural steel. Apparent low bidder was U. S. Steel from Atlanta for \$23, 534, 300; Government estimate was \$30, 459, 625. Canaveral District expects to make awards on these two contracts this week.
2. Procurement of Launcher Umbilical Towers, Complex 39. LOC was advised on July 2 that GAO ruled Ingalls Iron Works was responsive in their bid. Official notice is being forwarded. Action is being taken upon receipt of the official notice to award the contract to Ingalls Iron Works. This has caused a delay of 43 days. The impact of this delay is now under study.
3. Crawler-Transporter for LC-39. Preliminary "information" drawings of the crawler-transporter were received from Marion Power Shovel Company on June 25. The drawings were submitted for detailed study and familiarization by LOC before the design review meeting, now scheduled for the second week in July 1963.
4. Florida East Coast Railroad Easement. The grant of easement to the Florida East Coast Railroad was signed by the Vice-President of the Railroad on June 21, and recorded in the Official Record Books of Brevard County on June 25, 1963. Certified copies of the grant are being forwarded to the Facilities Office for their records and to Financial Management for any necessary action with respect to the contingent liability of the Government in connection with possible termination prior to the expiration of the 25-year term of the grant.
5. MILA Railroad. All bids received for the construction of the NASA portion of the MILA railroad have been rejected and the project will be readvertised on 10 July 1963. Reasons for not awarding the contract are, (1) the low bid exceeded the Government estimate by approximately 30%, (2) the low bid exceeded the funds available, (3) consultation with the bidders indicated probably ambiguity in the specifications, and (4) further consultation with FEC RR indicated changes in types of rails and accessories which will probably result in considerable savings to the Government. We plan to advertise this project again this week.

6. SATURN V Destruct Problems. Several meetings have taken place with MSFC to discuss the destruct problem related to SATURN V. In view of the lack of empirical data we have attempted to assess the problem from educated estimates. It is the consensus at the present time that "pancake" type explosives, which could be installed at the pad, may well be the solution to the total problem. It appears that these installations can be made quite simple and easily on the S-IC, S-II, and S-IVB while on the pad. We are presently formulating a policy with MSC as to the requirements for destruct packages on the LEM, escape tower, etc., as well as other ordnance to be installed such as retro rockets.

The present LOC and MSC plan is to prepare for negotiations with AMR, General Davis, to eliminate destruct packages on the spacecraft and that there will be no requirement to carry ground control or destruct systems in this area.

Initial negotiations with the AMR Range Flight Safety Division have taken place and they have indicated that the "pancake" destruct system seems worthwhile for further investigation. I will keep you posted on developments and prepare a final report to you on the outcome.

In a meeting with MSFC and LOC, a decision was made to allow installation of minor ordnance items and prima-cord up to 25 grains per foot during checkout in the VAB. These ordnance items refer to such areas requiring separation of stages, skirts, etc. No limiting factors can be foreseen concerning the efforts on our VAB operations.

7. Canaveral District. The personnel of Canaveral District, Corps of Engineers, were moved to the new district office building on Merritt Island July 6 and 7. All LOC business with the Corps of Engineers will henceforth be conducted with Canaveral District, excepting (1) real estate, (2) actions concerning the Canaveral Harbor Lock, and (3) relocation of the Inland Waterway in Area IV which will be handled with the Jacksonville District.

8. Operation and Maintenance of MILA Communications System. Proposals are still being held unopened pending resolution of problems involving interconnections with the Bell System. As of today, LOC' proposal has been forwarded to Mr. Lingle and a copy has been forwarded to you for your information.

9. Operation and Maintenance of JetStar. Lockheed Aircraft Service Company took over operation and maintenance from Capitol Airways on July 1, 1963. Capitol Airways lodged a protest of the award with LOC Procurement & Contracts only; this protest has been answered.

10. MSC Support. A supply service group to support MSC requirements is being set up. It will consist of 13 contractor personnel and one civil service (LOC) supervisor. It will be directly responsive to MSC as an extension of LOC warehousing services.

11. Apollo Building. This building was not ready on July 1 as scheduled. Approximate date of readiness is now estimated to be July 15.



July 8, 1963



X 1. ROAD & AIRSTRIP REHABILITATION

Additional justification for use by the Facilities Engineering Office for consideration to restore the \$385,000 cut by the House Committee for road and airstrip rehabilitation has been prepared. The justification emphasized the logistical aspects for the Saturn program. ✓

2. JULY 12 BOARD MEETING

As requested by Mr. Rees, Michoud Operations is preparing a presentation showing the present status of operations at Michoud. ✓

X 3. MASON-RUST CONTRACT

A contract has been executed with the Mason-Rust Company in the amount of \$11,708,225 to provide continuing support service for one year at Michoud Operations. ✓

G.C.

I told Cong. Teague the strip will be strong enough to handle the "Guppy".
In case you get the funds, please see to it that it really does.
Small aircraft isn't an adequate justification!
B

B 7/13



NOTES 7/8/63 DAVIS

No Notes.

B-713 17-8-63.
NOTES 7-8-63 FORTUNE

* 1. NASA Exhibit Big Hit at Gulfport Rodeo: Several thousand people a day visited the Manned Space Program exhibit at the Gulf Coast Deep Sea Fishing Rodeo, July 4, 1963. OMSF, LOC, and MSC contributed to this project as well as MSFC. Mack Herring, Ed Buckbee, John Hilburn, Margaret McCormick, and Wilda Stephens supervised the test area. The PIO gave fifteen minute talks on the Saturn and Apollo which drew a great deal of additional interest. ✓

2. Perimeter fence crew quit work because of mosquitos: Friday the mosquitos were so bad at the Southeast Sector of the Fee Area that the colored crew erecting the fence quit working. This morning a crew was gathering to go in again. We heard that the Standard Oil Company of Pascagoula also had labor stoppage from mosquitos Friday. Dusty Rhodes, our field engineer Liaison with the Area Engineers, estimated 20% loss in overall effectiveness of construction personnel because of this problem. We have been trying to get Jim Smith, NASA Headquarters, to expedite aerial spraying of the Fee and Buffer Zone which is what Public Health Service has recommended in their report on MTO. ✓ *Suggest we bite back.*

3. Conference with Mississippi Employment Security Commission Monday: This afternoon we are meeting with State and area representatives of the Mississippi Employment Security Commission to discuss employment policies, hiring needs, GE reports, requirements, etc. Mr. Bill Roy, Manager, General Electric Plant Support is on board and will participate. ✓

* 4. Telephone Service: Southern Bell's switchboard operations and service to the contractors and MTO were made operational today. ✓

B-7/13

✓
17-8-631. NASA Research Committee on Missile and Space Vehicle Aerodynamics:

On June 6 and 7, 1963, Mr. E. Linsley of Aeroballistics attended subject meeting in my place, and presented "Current Recovery Studies at Marshall and Some View-points in Incorporating Recovery in Vehicle Systems." The presentation is currently being put into report form and we shall send you a copy soon. The presentation was well received, and evoked considerable group discussion. Great interest was shown as to our degree of actual hardware development. Linsley's reply was that a second phase to the Saturn V program, i. e., a fixed wing recovery of the first stage is being studied at present in a follow-on Boeing contract. The implementation of this recovery system hinges on missions that are yet to be established, other than the manned Apollo, such as space stations, lunar logistics, etc. In general the committee members were not overly enthusiastic since there has been no conclusive evidence of great cost savings resulting from these recovery systems, without having any current long range program involving sufficient successive flights to make the recovery system pay for itself.

Another interesting presentation made at this meeting by Mr. Huber of Langley dealt with "RF Signal Attenuation Problems During Reentry into Planetary Atmospheres." Although a survey of many Mercury Problems was presented, the significant part of the discussion was that water injection ahead of antennas on a reentry body may have a very significant effect in reducing signal attenuation due to ionization. Tests on a model at 20,000 fps have shown that even small quantities of water are extremely effective. We think that a further benefit may be realized if this helpful effect is maintained at greater than escape velocities. This effect pertains to maintaining body shape at reentry speeds above escape velocities. H. J. Allen (Ames) has pointed out that, at extreme velocities, radiation heating will be the predominant heating factor on reentry bodies. In this case, solution for survival may require pointed bodies with inclined shock fronts rather than the blunt-faced Apollo type with its strong normal shock. One means of maintaining the sharp nose is by the use of water injection at the body apex. The water has the potential, then, for maintaining body shape as well as reducing signal attenuation. ✓

X
2. LIEF Presentation In Washington: On 6-28-63 Dr. Speer gave a 30-minute presentation on Project LIEF to Debus, Freitag, Low, Shea, and many others. Shea reserved his decision until mid-July when more details of equipment requirements will be available. He questioned our relatively low cost estimates and was concerned about manpower requirements which might develop later. Shea has probably no objections to LIEF, but is generally afraid of possible implications. Therefore, his request for precise detail requirements was made. However, chances for approval still appear to be good.

In a subsequent LOC presentation on CIF (Central Instrumentation Facility), Shea strongly questioned the general computer setup on the Cape (checkout vs general purpose, launch vehicle vs spacecraft). He requested Underwood and Bellcomm to start a study immediately. This may have important consequences for MSFC. ✓

1. S-I-7 VEHICLE: The S-I-7 vehicle was transferred to building 4708 on June 28, 1963 where preparations for weighing are in process. Pre-static pressure and functional tests were completed on June 27, 1963; however, screen systems had not been completed due to hardware shortage. ✓

2. REORGANIZATION OF THE DIVISIONS: The effort for reorganization of the Divisions, which was expended by the Central Planning Office in co-operation with the Divisions concerned, has resulted in a series of plans which I understand are ready for your approval. I suggest that the green light for implementation of the plans be given. If selected areas need further attention prior to your approval, I would suggest that the areas which are considered clear be earmarked for immediate implementation. So many personnel actions (reassignments, promotions, decisions of people to take appointments in the field) are being held due to the pending reorganization that further delay of a decision continues to increase the management difficulties which are a by-product of a period of uncertainty. *Have Maile*
Please drop me a note on CP's plans re implementation
B

3. MICHOUD TEST COMPLEX: The Network Test Station and Instrumentation and Telemetry Station have arrived at Michoud Operations and are being installed by Packard Bell personnel. The Central Computer equipment is due at Michoud from Packard Bell this week. Flak curtains for the first station have been installed. ✓

4. QUALITY PROGRESS REVIEW MEETINGS: Quality Progress Review Meetings, involving the major stage contractors, the respective government inspection agencies and the Saturn Systems Office, will be held at three-month intervals starting on July 23rd. ✓

5. MICROMETEOROID: Mr. H. R. Harold (Director, Electronics), Mr. W. B. MacCulloch (Montreal Area Director), and Mr. W. D. Sidaway (Resident Supervisor at RCA Victor, Montreal) from the Canadian Department of National Defence Inspection Services (DND/IS) are visiting with the Quality Assurance Division this week (July 8, 9, and 10). The Canadian DND/IS is acting as our government inspection agency at RCA Victor, Montreal, a subcontractor to Fairchild Stratos Corporation. ✓
capability

6. ENVIRONMENTAL TESTS: During the past year, July 1, 1962 to July 1, 1963, in its facilities in building 4708 the Quality Assurance Division has conducted the following tests:

(EITHER single or whenever feasible conducted environmental tests)

<u>Division</u>	<u>Major Tests</u>	<u>Minor Tests</u>
Astrionics	17	70
Launch Vehicle Operations	5	8
Propulsion & Vehicle Engineering	2	12
Quality Assurance	12	20
Aeroballistics	1	0
Test	0	4
Manufacturing Engineering	0	3

✓

NOTES 7-8-63 GRUENE

7-8-63
B 7/13 ✓

1. S-IVB Checkout for Saturn IB Vehicles: Under present schedules, 39 Low Bay will not be ready for stage checkout for the first few S-IB vehicles. Internal discussions with DAC-AMR are underway to determine what stage equipment is necessary for S-IVB checkout in Hangar AF before erection. ✓

2. VAB-39: Bids on structural steel and foundation contracts for VAB-39 were opened. The bids were very favorable compared to government estimates. ✓

3. LUT-39: The contract for the Umbilical Towers was awarded to Ingalls Iron Works. ✓

NOTES-7/8/63-HAEUSSERMANN

h7-8-67 B 7/13

MICROMETEOROID CAPSULE: During the 3rd status review conference on the Micrometeoroid Capsule project held at MSFC on June 26 and 27, a makeshift model of an extremely simple one shot actuation system for the deployment of the sensor panels and the solar panels was demonstrated to representatives of Fairchild Stratos Co. (FSC). The model verifies the feasibility of the drive. Principle: A determined volume of incompressible fluid (water) is pressed through a properly dimensioned orifice into a bellows by use of an air actuated expandable diaphragm. The displacement of the bellows is used to actuate the drive crank of the central deployment drive shaft. The unit is completely sealed and therefore highly adaptable to operation in space environment. Because of its simplicity the actuator suggested should be more reliable. The cost is estimated to be approximately one third of the present motor-gear-drive. FSC has indicated they may use the proposed actuation as back-up. for 2 units??

S-IV-D ACTUATOR: Reference Notes 7-1-63, Item 2. DAC claims that the change to Moog actuators (of which over 100 have accumulated at Douglas) would delay S-IV-5 and -6 by 6 weeks, which, in our opinion, is grossly exaggerated. SSO is evaluating the time schedule. Further information will follow after today's meeting with Douglas representatives. ✓

NOTES 7/8/63 HEIMBURG

B-7/13
6-7-8-93

* 1. S-IV-5: (DAC/SACTO)

The vehicle assembly is scheduled to be completed this week with the installation of the remaining instrumentation system items. All facility and GSE checkouts have been completed and approximately 20% of the vehicle checkouts have been made. Mr. Heimburg and Dr. Lange are at SACTO to firm up a realistic firing date. ✓

2. SOUND SUPPRESSION TEST STAND (H-1 ENGINE HOP STAND):

An 11-second duration test was conducted 7/2. Minor additional burning was noted on the deflector plate. The reduction of sound in decibel level was similar to the last test. ✓

* 3. MTF WORKING GROUP:

a. Notification to proceed given to Aetron for MTF Phase I Technical Systems, 7/3, by M-P&C. (Re comments in 6/24 NOTES, Attachment 1). ✓

b. Dr. Seamans approved MSFC nominees to MTF Cryogenics Plant Evaluation Board as follows:.. H. Auter, M-MTO, Chairman; W. Marsalis and J. Hauser, M-TEST; H. Dyer and W. Montgomery, MTF Working Group; J. Jones and G. Dison, M-P&C. Dr. Seamans also appointed Quarles Brown and W. R. Harwood to represent NASA Headquarters on the Board. First meeting planned by 7/12 to finalize and approve request for proposal (RFP) package prior to release to contractors. ✓

c. Letter Amendment #1 to contract with GE for MTF support was executed 6/28. Mr. George Ward assigned to MTF Working Group as Acting Manager of GE Facility Activation Support. GE came on board 6/3, with 7 personnel in their Support Group, which was to have increased to 10 by 7/1. At present, only 5 GE personnel are on board; however, GE states that this group will increase to 17-19 by late August. ✓

ATTACHMENT 1

NOTES 6/24/63 HEIMBURG

NOTES 7-8-63 HOELZER

B2/B

67-8-67

X 1. EQUAL EMPLOYMENT OPPORTUNITIES UNDER SERVICE TYPE CONTRACTS:

A meeting was held on Monday, July 1, with Mr. Gorman, Mr. Hodgson, and local Marshall contractors on the subject of equal employment opportunity. The meeting was preparatory to a meeting in Washington on Tuesday, July 9, of those contractors having "service" type contracts with Marshall. The Manager of General Electric, Huntsville Operation, will attend the Washington meeting.

A meeting of Huntsville contractors was also held on Friday, July 5, to discuss ways of coordinating the efforts of local contractors to improve the opportunities for employment of non-whites. A committee was appointed to draw up a charter and take the first steps toward organizing this group of contractors under the name of "Huntsville Contractors Equal Employment Opportunity Committee."

B7/13
67-8-63

NOTES 7-8-63 HUETER

1. LUNAR LOGISTICS SUPPORT: Major Tom Evans, OMSF Advance Studies, was at MSFC on July 3 for initial discussion of our evaluation of the lunar construction proposals submitted to NASA by the Chief of Engineers. The following points are among the more significant gathered from this meeting:

a. The 55 ft. diameter lunar environmental test facility proposed by the Corps of Engineers is marginal even for Phase I (LEM truck) operational testing. It is our opinion, and Evans apparently agrees, that a 75 to 100 ft. diameter should be available.

b. The aforementioned test facility might well have to be supplemented with one of about 30 ft. diameter for individual component testing (Roving vehicle) with the best possible simulation of lunar environment. (With this facility, lunar environmental requirements for the large test facility may be relaxed).

c. Shea and T. Evans expect Marshall to submit facilities requirements for the lunar logistic support by August 15 in order to arrive at a decision on items a and b around September 1. The intention is to award a design study on the lunar environment test facility to the Corps of Engineers around the first of October. This requires intensive work on our side to establish first an adequate test plan and then over-all criteria for the test facility design study by August 15.

d. My tentative '64 plan, as I presented it in the Executive meeting on June 28, met with OMSF plan and was agreed upon as a tentative target. You might remember that this target was "to be ready for hardware contracts by October 1964."

e. Tom Evans is further pushing the Army/NASA teamwork in the lunar base area. He favors a tentative discussion with General Hayes on that subject when he is here at Marshall for other reasons on July 18. I hope that you or Mr. Rees have time to sit in on this. ✓

* 2. 1964 FUNDING FOR MMM STAGE: I have talked with Dr. Lee, NASA Headquarters, about who was "carrying the ball" within OMSF for future MMM effort. I advised Dr. Lee that we are not expecting a full-fledged project assignment in '64 but are looking for support funding to carry out preengineering and predesign studies with certain experimental work. He asked how much money did we feel would be needed to carry out the FY 64 effort and I estimated \$5M. His response was, "What could you do with \$2M?" We are currently costing out a FY 64 program. ✓

B 7/13

7-8-63

1. DISCUSSION WITH JIM FARRIOR

On July 2, 1963, I had a discussion with Jim Farrior concerning his possible participation in our study program. You requested a short report on this meeting. We discussed the ground rules of competitive bidding, the scope of our study program, as well as the detailed bidding procedures. He, in turn, gave me a rundown on the capabilities of his group. In summary, I told him that "everything being equal" we prefer a local contractor in the interest of efficiency and conservation of time and money. ✓

X 2. NATIONAL COST WEEK

We refer to this week, jokingly, as the "National Cost Week," because we happen to have three orientation meetings on new study contracts with STL, Lockheed Corporation, and General Dynamics to kick off a major effort on a MOD II LAUNCH VEHICLE COST ESTIMATING PROCEDURE, including reliability trade-off relationships. These contracts have just been signed and we hope that in less than one year, with the help of these contracts, we will be able to improve the state-of-the-art in costing techniques considerably. At the present time, we have three Mod I cost models operating to gather experience: (1) launch vehicle cost effectiveness, (2) national booster program cost and cost effectiveness of all its elements, and (3) a lunar transportation model with emphasis on cost effectiveness. ✓

B 7/13

7-8-63

1. Saturn V, S-IC Stage:

a. After evaluating many tests simulating the .224 inch "Y"-ring to bulkhead weld, we have reached no definite conclusions as to the cause or what corrective action would prevent the porosity problem experienced on the upper fuel tank bulkhead. Tests are continuing to determine the cause. ✓

b. Tests will start this week utilizing a segment of "Y"-ring and one test skin panel for the .810 inch thick weld. Welds will be made from both sides and if successful the upper bulkhead will then be welded to the cylinder. ✓

c. Three skin panels have been now welded together with the second weld requiring only one repair. ✓

d. The gore segments for the lower bulkhead being remade at Ryan have still not been delivered, tolerance problems are being experienced; however, we expect to overcome this next week. ✓

2. Saturn 1, S-I Stage:

a. SA-5 Gox pressurizing screen has been replaced and Booster is planned for release to Test Division for transportation to the Cape on July 15 after some additional modifications. ✓

b. SA-6 will be transferred to Quality Division today (on schedule) for final functional checkout. ✓

X 3. S-IV Stage:

As a result of a request from Dr. Rees we will ship today to Douglas some redesigned parts for the S-IV-5 umbilical Lox and LH₂ Disconnect. These parts were made here and furnished to Douglas due to their inability to make the change without a schedule delay. ✓

B7/13 67-8-63

* 1. SATURN IB: RCA-110A computer contract approval is held, as Dr. Shea questions the RCA-110A computer's capability to meet the Saturn V requirements. Mr. Holmes, Dr. Shea, and Captain Freitag will discuss this problem on 7-10. The Saturn IB computers are included in this contract; therefore, a teletype to Captain Freitag requested to approve the Saturn IB portion in July 10th meeting since the launch of SA-201 will slip if the contract is not let by August 15. ✓

S-IVB: (See Attachment 1) Notes 6-24-63 Lange

2. SATURN V: S-IC - Boeing's reply to MSFC's Mod. 1 (Plan V) manhour recommendations is expected today. Overhead negotiations will continue this week. MSFC will furnish complete design criteria on 7-15-63, after a meeting has resolved differences over design criteria definition.

Manufacturing delays amount now to approx. 8 weeks; documentation is running 13 to 15 weeks late. Arrowhead promised delivery of duct hardware 12-1-63, but slipped milestones of testing, tooling, and component procurement.

The Test Fuel Tank is delayed 12 weeks due to porosities in bulkhead to Y-Ring welds. S-IC tank skin segments are being welded satisfactorily. ✓

* S-II - Mr. Lingle (OMSF) visited NAA/S&ID during the past week, and discussed the contracting method for the vertical assembly building at Seal Beach (negotiated contract vs solicited competitive bids).

Fabrication of at least one common bulkhead by strip seal close out technique has been requested.

Sideload arresting mechanism permitting cluster firings of engines in the S-II Stage is estimated at \$1.7 million and has been approved. ✓

* I. U. - A design and development contract for the Advanced Saturn Guidance Computer was returned from Hdqtrs. with the request to include NPC-250-1. ✓

* Apollo design loads have not been received from MSC. P&VE is analyzing the impact. ✓

Design and development portions of the Environmental Control System will be negotiated this week. Hamilton Standard and Fairchild Stratots have been selected for a dual development effort connected with a novel heat exchanger/water boiler design. ✓

* 3. The Shea proposal regarding Panel Review Board activities exceeds our offer for Hdqtr. participation and contradicts Project Office responsibilities in the present Charter. Review required before MSFC commitment. ✓

* Interface documentation and MSFC repository functions were coordinated within MSFC and with LOC and MSC. Final document expected in about 10 days. ✓

An integrated EDS test program for SATURN I has been initiated with ASTR carrying overall responsibility. SATURN IB and V preliminary EDS criteria expected for August. ✓

NOTES 7-8-63 MAUS

67-8-63

1. SEAMANS - WYATT VISIT (JULY 9-12) - The following 23 people will arrive Tuesday evening with Dr. Seamans:

Office of Programs: Wyatt, Fleming, Jenkins, Crobough,
Maggin, Malaga, Oppenheim, Redfield

OMSF: Freitag, Lord, Kafka, King, Koenig

Office of Administration: Cadle, Haase, Velander, Elliott,
Croxall

Procurement Team: Lingle, ^{*}Brackett, Brewer, Charles,
Vechietti

* Lingle, Brackett
& Charles
now arrives
at 11:08 am,
July 10.
Bh
7/9/63

Fifteen of these people will depart Wednesday evening. The other nine whose names are underlined above, will compose the team headed by Crobough. They will remain thru Friday, then return to MSFC on Monday evening of the week following.

- X 2. JULY OMSF PROGRAM REVIEW - MSFC is requested to give the MSFC status report at the July OMSF Program Review on July 25. Six spaces are allotted for MSFC representatives, including those making the presentation. One hour and thirty minutes is allotted for the MSFC status report and an additional 30 minutes is allotted for the special presentation on LH₂ Technology.
- X 3. MANPOWER - The year end, June 30, civil service manpower status was exactly equal to the FY-63 ceiling of 7,332 spaces. It was necessary to terminate 66 temporary employees to stay within the ceiling. Specifically, we finished the year with 6821 permanent employees, 265 summer students, 11 consultants, 113 co-ops, and 52 temporary employees. Additionally, we had 31 military personnel on-board, but they are not counted against the manpower ceiling.
4. PERT APPLICATION TO FACILITIES PROJECTS - For the past 2 months, PERT Office has been working with Management Systems Corp. to develop a training course on application of PERT to facilities projects. The course is now in shape for final review which will be held here July 24-25. In addition to facilities people from MSFC, representatives of MSC, LOC, and NASA hdqs will participate. We expect the first 28-hour session will start on July 30, and that 125 MSFC people require this training.

17-8-63

X 1. SATURN BLOCK II, SA-8/9, MICROMETEOROID MEASUREMENT CAPSULE: It is recommended that the modified Boilerplate Payload (Apollo Configuration) Service Module, including the Insert and Adapter, be completely assembled at MSFC, and shipped as one complete unit, in a horizontal position, via the "Pregnant Guppy" to the Atlantic Missile Range (AMR). This plan will provide the optimum method for assembly transportation and handling at MSFC and AMR. ✓

2. ARTIFICIAL GRAVITY EXPERIMENT (AGE): The possibility of using two Saturn IB launches for putting an AGE configuration into a 485-km earth orbit giving a six to twelve-month stay time has been studied. The ground rules used (stay time, radiation shielding, etc.) resulted in a weight of the AGE configuration exceeding the performance capabilities of two Saturn IB's. ✓

More details can be furnished if a presentation is desired.

3. LEWIS RESEARCH CENTER (LeRC) FACILITY: LeRC apparently still plans to build a facility (probably in Nevada) capable of testing complete nuclear rocket stage systems in a space environment. The cost of the facility is supposedly justified by the elimination of a requirement for flight testing. An advertisement by Kaiser Engineers in the June 17, 1963, edition of "Aviation Week" confirms the fact that LeRC is actively pursuing this facility. This project came to light approximately a year ago and was reported then in the "Notes" (NOTES 6-18-62 MRAZEK, para. 1, copy attached). We thought it had died out because of lack of support. ✓

X 4. SPACE AND INFORMATION DIVISION ACCEPT SUGGESTIONS ON DESIGN OF S-II STAGE HYDRAULIC SYSTEM: After having difficulties with their own system design, Space and Information Division, North American Aviation, Inc., are now receptive to suggestions and comments from the Liquid Power Plant Engineering Section, Propulsion and Mechanics Branch, this Division. Suggested changes are being incorporated in the redesigned pump and accumulator. ✓

5. SA-3 RETROROCKET HEATING RATES REVISED: Thermal reflectivity of SA-3 vehicle exterior paint has been determined. Utilizing this data, retro-rocket heating rates estimated from SA-3 vehicle skin temperature data have been revised. The revised heating rates include the thermal radiation reflected and absorbed by the paint surface, i.e., incident radiation. Estimated retrorocket heating under SA-3 conditions is from 57 to 77 BTU/Ft² per second. ✓

6. IN REPLY TO NOTE REGARDING LUNAR EXCURSION MODULE (ROUTING SLIP DATED 7-1-63): Yes, the payload question is still unsettled. We received four different versions of payload for study. We hope we can make a decision soon. Your question as to whether the mode of carrying the Lunar Excursion Module (LEM) (load through landing legs or into LEM body direct) has been settled; can be answered affirmatively. For clarity, the MSC is continuing studies of LEM legs and adapter configurations. They are, however, excluding concentrated interface loads with the instrument unit. The LEM will be supported from the conical adapter by either one of two methods: (a) Use shear panels from the LEM body to the adapter, or (b) Use the LEM leg hard points (or a portion of the folding leg) and attach supports to the adapter. ✓

ATTACHMENT #1: NOTES 6-18-62 MRAZEK

ATTACHMENT #2: MSFC ROUTING SLIP dtd 7-1-63

NOTES 7/8/63 Rudolph

✓ B 7/13

No Notes

NOTES 7-8-63 SHEPHERD

17-8-63 3-7/13

* S-II Facility: Messrs. Lingle and Long, NASA Headquarters visited S&ID and the Navy at Seal Beach on July 1 and 2, to discuss the Vertical Assembly Building funding and contracting problems. The Congressional paper work for the reprogramming actions were being held pending Dr. Seamans receipt of the report from this trip. Mr. Webb wanted to ensure that it was absolutely essential to negotiate this contract and that the cost figures were reasonable. Messrs. Lingle and Long were briefed thoroughly on the S-II program to date by Mr. Bowden and myself; on the Seal Beach construction work by Commander Dunnells; and on the manufacturing schedule by S&ID. Mr. Long had several private conversations with representatives of both the prime contractor, Shiff, and some of the sub-contractors at the job site. Messrs Lingle's and Long's conclusions and recommendations to Dr. Seamans were as follows:

- a. The Navy negotiate with Shiff ✓
- b. Sufficient time be given to Shiff and the Navy to obtain a better cost proposal from both the sub-contractors and suppliers. This will be accomplished by slipping the first joint occupancy date by approximately 60 days. This schedule slip would not effect the delivery date of flight hardware. ✓
- c. The specifications be relaxed to effect economies where technically feasible. ✓

Information this morning from Mr. Lilly's office is that the paper work will go from Dr. Seamans to Mr. Webb today for signature advising Congress that \$3.7M is required at the Seal Beach site for the completion of the Vertical Assembly Building.

Mississippi Test Operations (MTO): The presentation to you on July 5, by the Mississippi Working Group on the status of the MTO gives considerable cause for concern in the area of cost control. The figures given Friday were based upon criteria and early estimates and are not to be considered absolutely accurate at this time. However, they do indicate a serious problem. To clarify where we stand, a complete review will be made of all cost information pertaining to MTO. ✓

NOTES 7-8-63 Stuhlinger

B7/13
7-8-63

X 1. ESTABLISHMENT OF MSFC - AIR FORCE RESEARCH EFFORT:

We are presently formulating research and technology tasks which the Air Force may be interested in, and capable of conducting, for MSFC. Mr. Miles of RPD, working in cooperation with Captain Bollinger of Central Planning Office, has requested all MSFC divisions to submit applicable task descriptions to RPD by July 15, 1963. These tasks will be submitted to the MSFC Coordinating Committee for Air Force Support, which will forward suitable tasks to the Air Force for consideration. ✓

2. OVERSEAS MEETING: A letter dated March 20, from Arnold Frutkin's office, requested MSFC participation in the 5th International Symposium on Space Technology and Science, Tokyo, Japan, sponsored by the Japanese Rocket Society. Of seven abstracts submitted to Headquarters by MSFC, the one on base heating by W. K. Dahm of Aeroballistics Division was chosen for presentation at the symposium. ✓

178-07

B 7/13

1. F-1 ENGINE TESTING: Two tests were performed on engine 010 during this report period. One test was terminated because of high LOX pump discharge pressure. The other test was for scheduled duration. ✓

2. F-1 INJECTOR TESTS: Six injector tests were conducted using center and off-center mounted bombs. This phase of testing resulted in one test--injector X005 in a solid wall chamber--incurring self-triggered instability; injector X007, in a tubular wall chamber, incurred bomb-triggered instability which damped on three tests; one test incurred bomb-triggered instability with rough combustion cutoff, however, damping occurred prior to shutdown; and on one test, the bomb was blown from the thrust chamber. ✓

3. RL10 ENGINE: Air Products and Chemical, Inc. (APIX), who operates the liquid hydrogen Air Force Plant No. 74 in West Palm Beach, Florida, could not guarantee complete reoperation of the plant by 7-8-63 as previously anticipated. As an alternative, APIX recommended to the Air Force that certain modifications and repairs be made to preclude the frequent shutdowns of the past. This plan would necessitate plant shutdown through 7-21-63. The Air Force agreed and forwarded the proposal to us via NASA Propellant Office in Washington. After confirmation of sufficient capability to haul propellants from the West Coast, it was decided to shut down the plant to incorporate the modifications and repairs.

An order has been placed to transport 150,000 gallons of liquid hydrogen per week until the West Palm Beach plant becomes operable. This condition is still not considered detrimental to the Florida test operations.

A total of 61 engines have been shipped to date, only one less than the contractual requirements through June.

Engine testing totals to date are as follows:

- a. RL10A-3-1 substantiation - 492 firings - 67,248 seconds.
- b. RL10A-3 production support - 395 firings - 49,705 seconds.

The RL10 R&D Program was presented to OMSF on 6-28-63. The presentation described the funds and effort required to support the total NASA requirements during level of effort presented, and an agreement was reached that the throttling program could continue on a low level of effort. The program will be re-evaluated after several vehicle flights are made. ✓

4. J-2 ENGINE: Fourteen engine system tests have been conducted on Vertical Test Stand 2. These tests were of short duration (two and three seconds) to determine the effects of a thrust chamber-mounted diffuser (for ground testing) on engine side loads. Three uncooled diffuser configurations have been tested with these same results. The side loads during transition do not appear to be appreciably reduced by the diffuser; however, side loads at cutoff and at low thrust chamber pressure during mainstage are considerably reduced. The diffuser is a six-inch cylindrical extension with an additional six to eight-inch, 15-degree, half-angle, conical section attached to the engine thrust chamber. ✓

5. H-1 ENGINE: Due to the type of tests being conducted at this time, the H-1 engine program has not lost any test effort during this period as a result of the LOX shortage at Santa Susana. The test effort now consists of short-duration bombing and pulsing tests on the Low-Fuel Delta-P injector; and conducting one duration test on the improved turbopump, then removing it from the engine for inspection. ✓



INVEE

July 15, 1963

VOID HERE
FOR CLOSURE

THE



Sanmon

NOTES TO HOLMES 7-23-63 DEBUS

1. FY-64 Proposed By House Space Committee: The House Space Committee has recommended a cut of \$33, 178, 000 in the LOC FY 64 C of F budget. They did not identify this cut by line items but left the distribution to our discretion.
2. FY 64 Reclama Action Before Senate Committee: On 17 June, Mr. Webb appeared before the Senate Committee and reclamaed all projects except the Vehicle Maintenance and Service Facility and Advance Design Funds. We had recommended no reclama on the Optical & Electronic Component Service Facility and the Calibrations and Standards Lab and had recommended a reclama on the Vehicle Maintenance and Service Facility.
3. NOVA Launch Facilities Study: This study is progressing on schedule, and it is expected that a very comprehensive Phase II (Part I) report will be complete by the due date of September 9, 1963.
4. Base Communications - Bell Telephone: Negotiations are in progress with Mr. Yates of Bell and we should have a proposal to Hqs. soon. Mr. Lingle has been abreast of the status all through the negotiations.
5. MILA Base Service Contract: Action was taken to incrementally fund the MILA Base Services Contract. The period of performance for this contract is scheduled from November 1, 1963 through October 31, 1964. The contract was funded in the amount of \$5, 619, 000 covering that portion of the contract to be performed in FY 64. Facilities and utilities maintenance, fire protection, supply operation, motor pool and marine transportation services, security and medical services are included in the estimated \$9, 000, 000 contract.
6. Contracts Awarded: The following contracts were awarded (reference prior notes on bids):
 - (a) Weights and Balance Building - Awarded to J. H. Sapp, Inc. 17 July 1963.
 - (b) Central Supply Building and Fire Station - Awarded to Franchi Construction Co. 17 July 1963.



(c) Interim Water Supply - Awarded to Voigt Construction Co. 15 July 1963.

7. Automotive Vehicle Contracts (NAS10-786 and 800): Contracts for the rental of approximately 200 automotive vehicles (passenger cars, buses, and light trucks) were awarded to Management Services Incorporated of Tennessee. These contracts represent the major portion of standard vehicle requirements through January 31, 1966.

8. Operation and Maintenance of JetStar: Award of contract to Lockheed Aircraft Service Company covering operation of JetStar has been protested to the General Accounting Office. Information is being compiled for transmittal to Headquarters.

9. LOC Disaster Control Plan: has been coordinated with AFMTC and necessary changes made to insure that it is in accord with the latest revision to the AMR Disaster Control Plan. Only one significant change was required. For security reasons, AMR has gone from the previously used DEFCON system to a Phase 1 through 3 system. The change is then simply a matter of equating the previously used DEFCON steps to the new "phases." This has been done and the plan will be distributed within a week with no reference to DEFCON.

10. Space University: The site selection program is gaining momentum in Brevard County. The County Commissioners have planned an all-out effort to present Brevard County as the home for the new university complex. (So are other counties.)

11. University Research Grants: Proposals covering studies concerning the "community impact area" have been developed. Dr. Simpson and Mr. Towne will visit LOC in connection with these studies on July 30.



Saomon

NOTES TO HOLMES 7-17-63 DEBUS

1. MILA Railroad. As previously reported, approval for the transfer of \$528,000 from the NOVA project to cover an estimated deficit in the railroad, has been requested from NASA Headquarters. Corps of Engineers has been authorized to readvertise prior to receipt of funds. Approval is expected prior to bid opening on July 25.
2. Weight and Balance Facility. Bids opened 9 July 63. Apparent low bidder was J. H. Sapp, Inc. in the amount of \$1,276,891.10. Government estimate - \$1,320,288.25. A total of 9 bids were received, 3 below and 6 above the Government estimate.
3. Central Supply Facility and Fire Station. Bids opened 9 July 63. Apparent low bidder was Franchi Construction Co., Newton, Mass. Central Supply - \$635,757; Fire Station - \$195,906 for a total of \$831,663. Government estimate was \$895,387. Seven bids were received.
4. Structural Steel, VAB. In addition to the contract award, a Notice to Proceed was issued 9 July 63. The schedule calls for delivery of steel to the job site within 120 days (Nov.).
5. Foundations, VAB. Contract award and Notice to Proceed issued simultaneously 11 July 63. Schedule calls for the commencement of pile driving operations 12 Aug. 63.
6. Procurement of Launcher Umbilical Towers, Complex 39. Contract executed with Ingalls Iron Works at Birmingham July 8, 1963 with contract distribution scheduled on July 9, 1963.
7. Operational Intercom and TV Systems for LC 39. LOC has been authorized to proceed with a sole source negotiation with Molecular Research, Inc. for design of these systems for LC 39. No more than six months can be allowed for design and since Molecular Research did the preliminary studies and development of criteria it is believed that they can complete the design in a much shorter time than another AE who is not familiar with the required systems. The fabrication and installation of the systems will not be sole source but an advertised, competitive contract.



8. Helium Procurement MILA. AFMTC (Carey) contacted LOC with reference to NASA's procuring all Helium for NASA and the Air Force when we have an active rail siding for rail car delivery in Complex 39. Col. Carey wants to get out of the Helium procurement business at this point and have NASA procure for them so they can get rid of the rail siding at Melbourne. This looks reasonable.

9. Apollo Building. Initial moves of LOC elements occurred on July 12, 1963 to this new building (private enterprise).

10. Cocoa-Titusville Airport. FAA officials visited this area to discuss the proposed requirements that LOC has for expansion of the Cocoa-Titusville Airport. It was concluded that a joint study between FAA and LOC would be made thus compromising our original position on requirements and that suggested by FAA. It appears that FAA will finance facilities expansion but to a scale considered adequate only for present operations. (Runway length 6000-6590 feet)

11. Solid Propellants Rocket Exhaust Effects. A final presentation was made by personnel of Martin-Marietta Corporation, Denver, Colorado, on the study "Solid Propellant Rocket Exhaust Effects and Methods of Attenuation." After extensive testing, two different deflector materials appear to be attractive; these materials are fused Silica, and a composition named "Martite."

12. Recruitment. Civilian personnel spaces for the end of FY 1963 are as follows:

Authorized by NASA	1259
Total on board	1182
Vacant	77
Firm Employment	
Commitments	93
Commitments in Excess	
of Current Ceiling	16

There seemed to be a misunderstanding develop at Headquarters on the requirement for spaces during the "continuing resolution" period. This has been cleared up with Romatowski and he will pursue it.

13. FY 64 R&D Funds. LOC has received Program Authorization for the total 1st quarter funds in the LOC request of \$30, 000, 000. Sufficient funds for obligation for the month of July (\$11, 400, 000) were received.

14. FY 65 CofF. A meeting was held last week with OMSF, Holcomb, Toppen, Redfield, and D'Onofrio for planning the detailed write-ups for the FY 65 CofF Program. On August 2 the entire submission will be reviewed by Freitag, Low, Lilly, Diaz, and probably Wyatt.

15. The "Pregnant Guppy" aircraft landed at the skid strip (Thursday) and the S-IV shell was off-loaded. The S-IV-F stage will be loaded this week. Flight tests are planned around this area until Saturday and then flights around the trans-continental shipping routes until 20 July. The stage will be returned to AMR for umbilical mods and then to MSFC for stratification tests.

16. Visit of Dr. Seamans on the 31st of July to GE in Daytona Beach and then to LOC on 1 August has been established. You are more than welcome to be here if your schedule permits.

Donnan

NOTES TO HOLMES 7/30/63 DEBUS

1. Launcher/Umbilical Tower for LC 39. On July 17, 1963, notice to proceed was given to the contractor (Ingalls Iron Works Division, Birmingham, Alabama). The contract is to provide and erect the steel frame. Total contract cost is \$11,225,459. A schedule delay of approximately five weeks has occurred because of the non-responsive protest action which was recently resolved by the Comptroller General. Acceleration of the schedule has been discussed with the contractor, who will not be in a position to speak firmly on this subject until the PERT network is completed about August 14, 1963. This is due mainly to his subcontracts. Progress charts have not reflected this slippage because it is an unknown quantity until negotiations determine to what extent the schedule can be accelerated.
2. Procurement of the Base Operations Support Services (MILA). Headquarters has advised that because of the sensitivity of this procurement, i. e., public and political interest, a Source Evaluation Board will be required with membership of LOC and Headquarters (Messrs. Alton and Wilhelm). The procurement plan is being prepared and should be available for my review about the 1st of August.
3. MILA Base Communications. When negotiations with Southern Bell are completed for MILA Base Communications we will proceed with development of a separate contract for the operational communications on Merritt Island. Our work statement for this service is completed and we should have it in the hands of P&C during the week of 29 July. Our target date for having a contractor aboard is still October 1, 1963.
4. Cryogenic Engineering Services for LC 39. Technical evaluation of 17 proposals (for the prospective contract "Cryogenic Engineering Services for LC 39") has been completed. We planned for, and requested, to have people aboard by July 1, 1963. It now appears that in spite of our efforts to expedite, September 1, 1963 will be the earliest date a contract will be effective. Design completion was scheduled for November 1, 1963.

5. Engineering Services Contracts with Brown, Hayes, and Chrysler Companies. To assure continuity of engineering services, plans have been developed to request Headquarters for authority to issue a "Letter Contract Amendment" to the existing contracts. The "Letter Contract Amendments" and the subsequent definitive amendments will cover the period August 1, 1963 through December 31, 1963.
6. Parachute and Paraglider Facility. Bids for Phase I were received 24 July. Eight bids were received with apparent low bid submitted by Bucon Construction Co., in the amount of \$325,415.99; Government estimate is \$375,835.05. Funds are available.
7. Mods & Elevated Floor, Hangar AF. Bids opened 24 July. Low bidder was Bucon Construction Co. in the amount of \$74,787; Government estimate was \$107,500.
8. Temporary Water Supply. Notice to proceed has not been issued to successful bidder for the wells pending review of probably early hookup to permanent supply. No final date slippage is as yet anticipated. Operation of the Army furnished water treatment equipment has been verbally arranged with PAA. Covering work order to follow.
9. MSC Support. MSC accepted our proposal to extend supply services by setting up storage and distribution areas in close support of their activities. This will involve 13 contractor personnel including a supervisor. We will be authorized technical direction and control of these personnel who will be furnished under an amended MSI contract.
10. Procurement of Propellant Servicing Systems (LC 39A). The procurement plan was forwarded to Headquarters July 23 for approval.
11. Titusville-Cocoa Airport. Joint FAA-LOC Southern Region Airport Study was concluded July 22, 1963. The FAA will modify the master plan and conclude provisions for extending N/S runway of the Titusville-Cocoa airport from 5,000 to 6,000 feet. FAA is in complete agreement with LOC requirements for air cargo and special aircraft landing and handling facilities at the airport.
12. Commission on Civil Rights. A Florida Advisory Committee for the U. S. Commission on Civil Rights held a meeting in Cocoa on 19 July. Our personnel office sat in the meeting as NASA

representatives. No particular dissention was voiced concerning any discriminatory practices or procedures by NASA. Various aspects of housing, particularly the non-discriminatory phases pertaining to FHA housing, were discussed with the Committee.

13. University of Florida. Dr. Reitz, President, and Dr. Martin, Dean of Engineering, visited LOC and PAFB concerning graduate needs in connection with establishing an extension of the College of Engineering, University of Florida, in this area. These visitors were thoroughly briefed as to our program, planned facilities, and types of personnel in the Cape Canaveral-MILA area. We continually emphasized the fact that this area should appear as the most logical area with personnel seeking graduate level work. Temporary facilities (The Brevard Junior College) have been offered the University for initial graduate programs. No decision is available at this time concerning the location of the graduate center.

14. Education. Dr. William Rich from the NASA Office of Educational Programs and Services, Mr. Walter R. Brown, Director of Youth Activities, and Mr. Robert E. Dearen, Science Supervisor, Board of Public Education, Brevard County, discussed with the Public Information Office the possibilities of sending outstanding secondary school students to the Launch Operations Center to meet with some of our engineers and technicians to read and discuss prepared scientific papers. The outstanding students would be selected by the National Science Teachers Association's Youth Science Congress.



*1. THE STATUS OF ENGINEERING & OFFICE BUILDING

gm

Phase I of the construction (piling and piling caps) is 40% complete with estimated completion date of September 23. Phase II (pre-cast concrete pillars, steel and steel erection) is on schedule with final completion of November 9. All steel will be shipped by July 22, 1963 and should be on dock at New Orleans before July 29. The steel shipment schedule was advanced due to the possibility of a rail strike after July 29. Phase III (completion of building) is presently being advertised and is scheduled for bid opening on July 30. All phases are on or ahead of schedule. ✓

*2. IBEW (INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS SOUTH LOUISIANA ELECTRICAL CONTRACTORS ASSOCIATION)

gm

At present three of our electrical sub-contractors have signed contracts and are working; however, the bulk of the association has not signed. If the strike continues it will have impact on certain areas within the plant. We are taking steps to have the union and contractors reach an agreement to continue work at Michoud. ✓

B 7/18

1. EXTENDED FLIGHT SIMULATION LABORATORY PROJECT.

(Re: Notes 7/1/63 Haeussermann, Attachment #1) The contract with R. E. Atckison was awarded November 7, 1962, in amount of \$28,968.55 upon valid sole source justification by Astrionics Division because the system was, in effect, a redesign of a "satellite source carrier system" that had been previously designed, fabricated, and installed at JPL by this same contractor. The firm possessed all requisite resources to perform satisfactorily. The Senior R. E. Atckison (father) unexpectedly withdrew his support of the son's venture. The son was thereafter unable to obtain financial backing and to muster the managerial and technical competence needed. Safeguards against such problems are provided in the form of progress reports, visits to the contractor's plant, and appointment of contracting officer representatives to monitor the performance of work. In this case, Mr. Hugh M. Feather and Mr. Josef Boehm, of Astrionics, were duly appointed with responsibility for assuring satisfactory progress and completion on time. There is no positive safeguard against contractor bankruptcy; however, this is the first such occurrence in MSFC within the last three years. ✓

* 2. NEGOTIATING WITH DOUGLAS FOR THE S-IVB SATURN IB/V.

9m (Re: Letter from Captain Freitag dated June 21, 1963, Attachment #2) Negotiations were officially opened on July 15. It is expected that two weeks will be needed to strike agreement on terms and conditions, with fee being reserved until agreement is reached on all other elements. Douglas' performance will be taken into account during fee negotiations. We fully expect to negotiate a lower fee. ✓

2 Attachments

1. Cy Notes 7/1/63 Haeussermann
2. Cy Ltr from Capt Freitag, 6/21/63

B 7/18

* 1. GE Contract. Four additional General Electric employees reported for duty during the week. The contractor will be in a position to begin operations very soon. The General Electric contract was hand carried to NASA Headquarters last Friday for approval. ✓

* 2. MTO Mosquito Control. The spraying of mosquitos is to get underway tomorrow. The Air Force, through Langley Field, is furnishing at no cost, two airplanes and personnel to spray the area. The insecticide, malathion, is harmless to fish and wildlife and was recommended by the Public Health people. A tremendous amount of credit is due to Mr. Jim Smith and Mr. Tom Ryan, of Capt. Freitag's staff, in getting the Public Health Service and the Air Force assistance. It is anticipated that this spraying will last through the critical period, which is the first part of August. ✓

WF
Suggest
letter of
commendation
to them
via Freitag
B

3. Employment of Personnel. The first former Gainesville resident has been employed and started work as secretary today. Some publicity will be given to the employment of this former Gainesville resident. ✓

4. Visitors to MTO. This past week, we have had several groups to visit MTO. Mr. E. W. Barr and Mr. J. P. Dreis of NASA Headquarters, Mr. M. T. Janner and Mr. B. R. Sewell of Kaiser Engineering Company, Mr. Lacey Thomas of Lockheed, and Mr. Ben Andrews, and Mr. Harris Dixon of Stanford Research Institute visited MTO July 12 pertaining to a sixty day transportation study on the MSFC stage transportation problems. Mr. W. L. Reed and Admiral E. P. Abernethy of North American Aviation came by to discuss MTO. General T. J. Hays and Lt. Col. E. E. Bennett, both from the Office of the Chief of Engineers, and Col. David Roberts, Mobile District Office, Mobile, Alabama visited MTO today. They are here coordinating Corps of Engineers matters. ✓

B 7/18

NOTES 7/15/63 GEISSLER

Dr. Geissler: Too much for NOTES from

- *1. Apollo Design Reference Trajectory: We have calculated an Apollo Design Reference Trajectory using the same lunar landing time as was used in MSC's report entitled "A Nominal Apollo Lunar Landing Mission Design Trajectory"-dated March 25, 1963. In the course of our calculations, several discrepancies and errors were discovered in the MSC trajectory. Specific flight phases covered by our analysis were: ascent from AMR into earth waiting orbit, trajectory during stay time in earth waiting orbit, powered phase to lunar transit injection resulting in a free return, free-flight transit to the moon with a closest altitude above the lunar surface of 148 km, and the free-flight return to earth. This circumlunar trajectory was based on a launch date of January 5, 1968 and for this particular date, resulted in a transit plane almost co-planar with the earth moon plane; by virtue of this, the trajectory represents a specific case. The study was restricted in its first phase to the generation of a free-flight circumlunar trajectory and did not consider powered maneuvers in the vicinity of the moon. Results will be published soon. A comparison of our trajectory with MSC's will also be published.
2. SA-5 Parametric Study: A parametric study of apogee and perigee has been completed and the results have been subjected to a lifetime analysis. Indications are that a total weight of 38,200 pounds can be injected into a 250 km elliptical orbit whose apogee is 680 km. (Weight consists of 13,000 pounds ballast and structure, the S-IV stage, nose cone, instrument unit, and 500# of residual fuel.) This represents the maximum injection weight possible under the present constraints of propellant loadings, ballast, propellant residuals and a 1 day minimum lifetime requirement. A revised standard trajectory for SA-5 is being established based on revised total vehicle weights, final propulsion data for the first stage, and preliminary propulsion data for the S-IV stage. Range Safety Division at AMR has requested some additional information on the impact probability analysis presented for the downrange area. These data are being prepared and will be submitted next week. Rigid body control study will start as soon as filter simulations are checked out and revised trajectory data are available. A liftoff motion study for SA-5 has been initiated.
- *3. Saturn IB Re-entry Tests: Mr. de Fries of Aeroballistics discussed this subject recently with Dr. Lee and Dr. West of Bellcomm. Dr. Shea has assigned this problem to Bellcomm. Dr. Lee said that they are contemplating having Mr. Holmes ask MSFC and MSC, by means of a letter to the center directors, to perform a general investigation of the Saturn V and IB 3 stager. Re-entry Test question. We are prepared to do this job should the assignment actually come. So far, Houston has remained aloof of OMSF on the subject of Saturn IB re-entry tests. We are trying to encourage OMSF to make the MSC working level contact. If Mr. Holmes actually makes the assignment to MSFC and MSC, this action would start the full scale investigation we want. If M-DIR could encourage Mr. Holmes to make the assignment soon, we could conduct the study prior to October when the Voyager study is to be presented to Dr. Seamans. The Saturn IB 3 stager re-entry study results could then be combined with those of the Voyager program which also uses the 3 stage Saturn IB.
4. Re-organization Approval: We have finalized our Division Re-organization Plans. I feel confident that you will approve them as they are. However, we are severely hampered in handling personnel actions by not having final approval from your office. I urge you strongly to review our proposal as soon as possible and give us an official approval.

RUSH

E.F. →

Maybe we can place this item on agenda for July Management Council. Please clarify with Mays & Andersen and furnish backup material.

CPO Timing?? B.

B-7/12

*1. SA-5 STAGE: The SA-5 stage was moved to the pressure test cell of building 4705 on July 5 for retest of the lower manhole cover of the center lox tank. The retest was satisfactory. Following the retest the stage was moved into the assembly area of building 4705. This retest was necessary because the cover was removed to allow entry of the tank when the gox standpipe screen was installed. The stage is on schedule for shipment to the Cape on July 17 pending disposition on whether it should be shipped on that date or stored for a period of time. ✓

2. SA-6 STAGE: The stage was transferred to vehicle test station for post-static pressure testing in the pressure cell of building 4705 on July 8. ✓

3. SA-7 STAGE: The SA-7 stage was transferred to building 4708 on June 28 for pre-static weight and alignment operations. Alignment operations are in process. Weighing was completed on July 3, 1963. ✓

4. S-IV-5: Saturn Systems Office has not required Douglas Aircraft Company to use adequate recording facilities for the post-static checkout of S-IV-5 as requested by this division, or the equipment which was supplied GFE for this purpose. Therefore, the instrumentation group in this division is working for the best possible instrumentation and telemetry checkout without such recorders. As of this date DAC plans to perform post-static checkout on less than half of the flight measurements.

5. S-IV-6: DAC has conducted the procedure for post manufacturing checkout of instrumentation and telemetry on the S-IV-6 stage and is now evaluating the data gathered. This procedure was rejected by the Performance Test Branch of this division, but Saturn Systems Office approved the procedure over the protests of this Branch.

6. CONTRACT REVIEW: In the procurement review operation a total of 150 contracts and 93 contract modifications were processed during the past week. Of the total contracts, 1 invoked NPC 200-2, 20 invoked NPC 200-3, and 34 invoked NPC 200-1. ✓

Request a
detailed
report



M-SAT

What is going on
against our

here? This is strictly
ground rules (Policy
Memorandum #1) B

NOTES 7-15-63 GRUENE

B 7/18

* 1. Destruct System for Apollo Vehicles: Range Safety gave a *gcm* briefing to LOC and MSC personnel on July 11, 1963 on a new proposed destruct system which uses a liquid explosive instead of prima cord for destruct of upper stages. The system will be used with an Air Force missile at AMR. If this new destruct system is feasible it could mean solution of problems like accessibility or disposal of explosives for recovery and manned stages in orbit. Mr. Zeiler will contact P&VE for design considerations. ✓✓

* 2. Problem Areas Discussed in Saturn V Mechanical Design Integration Working Group Meeting:

a. In the meeting, requirements for environmental control of the vehicle while in the VAB were presented. LOC will have to modify their equipment accordingly. ✓

b. For the S-II Wet Test, it was established that a cryogenic fluid must be loaded prior to LH₂ loading. It seems too hazardous to use LOX for Wet Test, and it would also preclude personnel from making leakage checks in the vehicle. Provision of LN₂ tanks for these tests is under investigation. ✓

* 3. Pregnant Guppy: The aircraft arrived at Cape Canaveral on *gcm* Thursday, July 11, 1963. The S-IV facility vehicle was loaded and instrumentation tests were conducted out of PAFB. The aircraft departed for Los Angeles on Sunday, July 14, 1963, and is scheduled to return the S-IV vehicle to the Cape later this week for the umbilical modifications. ✓

B 7/18

NOTES-7/15/63-HAEUSSERMANN

1. EXTENDED FLIGHT SIMULATION LABORATORY PROJECT: Reference item 7, notes of 7/1 (copy attached). R. E. Atckison Company had built the same equipment for the JPL facility as low bidder. Mr. Boehm thoroughly checked with JPL counterparts the low bid received for our equipment. The company had done a very satisfactory job for JPL and was highly recommended.

* 2. MOOG ACTUATORS ON S-IV, 5 and 6: A task group from M-SAT, P&VE, and ASTR, studying the time necessary to introduce the Moog actuators on these stages, will return 7/12 from visiting Douglas - Santa Monica and Sacramento. Further decisions about the possibility of phasing-in the Moog Actuator cannot be made before return of the task group. ✓

W.H.

→ Bill Davis advised me on reasons behind company's financial failure, o.k., such things seem to be unavoidable. But what action have we taken on continuation of this Flight Simulation Lab.?

B

1 Enc:

Notes of 7/1/62 (M-DIR copies only)

1. SATURN V STATIC TEST FACILITY:

Erection of steel was started last week on the S-1C test stand in the West Area. ✓

2. S-1C MODEL SOUND SUPPRESSOR:

Checkout tests were successfully conducted on the scale model sound suppressor using a 1:58 scale S-1C model cluster. Sound suppression tests will begin immediately. ✓

*3. LIQUID HYDROGEN STRATIFICATION MEASUREMENTS:

gan

A temporary test setup will be made on the pad adjacent to the H-1 engine static test stand, utilizing the S-IV "wet test" stage from AMR. LH₂ stratification measurements will be taken as soon as possible. These data are needed for S-II and S-IVB technical direction. Testing must start by the first part of September to allow P&VE time to meet deadline for giving design direction in October. ✓

4. S-IV-5, DAC/SACTO:

Electrical and instrumentation checkout in process. Propulsion checkout to start today. Test plan is to perform turbine-spin with lox in lox tank rather than LN₂, followed by an attempt to full-duration fire. ✓

5. MTF WORKING GROUP:

Construction of Area Engineers' Building at MTF starting today.

Mobile District Corps of Engineers (MDE) leased 66,000 square feet of floor space from the Naval Construction Battalion at Gulfport. This space will be utilized for storage in construction activities at MTF. MDE also awarded a \$2,163,238.00 contract to Carpenter Brothers, Dallas, Texas, for construction of warehouse and site maintenance building. ✓

NOTES 7-15-63 HOELZER

B 7/18

1. * FAIR EMPLOYMENT PRACTICES: Our contractor, along with others of this Center, has attended meetings locally and in Washington on fair employment practices. The General Electric Company, in its execution of its present contract with the Computation Division, will make every effort to comply with the recommendations of the President's committee which are as follows:

1) Increase the ratio of colored to white employment on government contracts;

2) Do all in their power individually and collectively as NASA contractors to improve local conditions for negroes so that more colored applicants can be attracted to the Huntsville area and those who are here will be encouraged to stay; and ✓

3) Actively promote the training and development of young members of the local colored population for employment under NASA contracts. ✓

B 7/18

*1. APOLLO LOGISTICS SUPPORT: OART task descriptions were *you* handcarried to Research Projects Division (RPD) for transmittal to NASA Headquarters on Monday, July 8. In addition, a list of seven study tasks was submitted to RPD as items which may possibly be accomplished by the Air Force under Project SUPER. A letter from the Office of System Studies, OMSF, was received Friday, July 12, which outlined tentative plans for the Apollo Logistics Support System (ALSS) during FY 1964. Basically, the letter indicates a second proposal to NASA, OMSF, Management in the spring of 1964 for initiation of ALSS development. (Our first proposal was made on April 2 of this year). FY 1964 funding spelled out in the letter amounts to \$2.950 million, which is considerably less than we have discussed with them in recent meetings. ✓

*2. SATURN/3RD STAGE: A Status Review of the S-VI Study was held *you* on July 9, 1963. Representatives from NASA Headquarters (OSS and OMSF), JPL, and LOC were present. The study is proceeding in a satisfactory manner, and MSFC will be ready to present the results to NASA Headquarters by the first week in October. The complete documented report will be ready by October 31, 1963.

The first Technical Review of the work accomplished by STL on the Saturn IB/Centaur Study was held at MSFC on July 10, 1963. STL gave a fine presentation to representatives of MSFC, JPL, NASA Headquarters (OSS and OMSF), and Lewis Research Center.

H.H.
→ What's the gist? Centaur still in serious competition with MMM for this job? B

B 7/18.

1. COST MANAGEMENT

One of the reasons why I am in favor of increased activities in the area of cost estimating and control is the desire to get a better reputation in this field as a Center. We do have quite a good reputation as a development group because of our firing record, but we do not yet have a favorable image in the area of cost management. I believe that the accomplishments and reputation of a Center in cost management will be decisive when it comes to the point of assigning the next major manned space flight project to one of the Centers. This will happen in about two or three years - just enough time to improve our reputation in the most critical area of cost management. It is pretty much up to us as to how we will look to the Administrator a few years from now. Without timely action and a reasonably strong effort, however, we will never make the grade and the future of our Center will not look so bright!

2. ANALYSIS OF MANNED PLANETARY FLY-BY MISSIONS

We are in the process of developing a plan to study, as an in-house effort, a Venus and Mars fly-by mission in the early Seventies, based on SATURN V capabilities. The purpose of this study is to start a small nucleus for a MSFC capability in this area and to educate ourselves. The work will be done in the form of an informal working group with contributions from all divisions. Our estimate shows that this 6 - 8 month study should not take more than the equivalent of two man-years of direct engineering labor, which we feel is in balance with the objective. Dr. H. O. Ruppe will be the project leader from our office. A detailed planning document will be published in about one month. Question No. 1: Are you in agreement with this in-house effort? Question No. 2: Do you want to see and approve the planning document (approximately 30 pages) before it is distributed?

3. NOVA STUDY

As you might expect, there is some discussion in OMSF relative to the FY 64 NOVA budget. We had asked for \$5M to continue, at the same level of effort, the GD/A and Martin contracts. Bill Lee and Doug Lord, in Dr. Shea's office, would like to cut it back to \$2M. Freitag, however, is in favor of continuing with the \$5M proposed by Dr. Seaman's office and used by MSFC. Also, the Shea people want to have the study under Mr. Gillespie (Planetary Studies in Shea's Office) rather than leaving it with the Vehicle Study people in Freitag's office.

We would like your support on the \$5M budget, as well as keeping the study under Freitag. No formal action is considered necessary; however, if you should talk to Shea, Freitag or Low, you might mention this.

HHK
HHK attended a large meeting in Washington on realistic appraisal of some of the more radical propulsion ideas for NOVA. Hope you have contact with him and crank results of this meeting into your next go-around on NOVA studies B

B-7/18

1. Saturn I, S-I Stage:

a. SA-5 Booster and 154" Instrument Unit essentially complete and will be retained in storage building 4705 pending further directives. ✓

b. SA-D5 entered the assembly shop for modification. It will be turned over to Test Division for Dynamic Testing on July 22. ✓

2. Saturn V, S-IC Stage:

The first cylinder has been successfully completed with no repairs in the last vertical weld. This cylinder will be welded to the upper bulkhead within the next ten days. ✓

* 3. Facilities:

gm

Operations in the newly installed autoclave have been started. We made our first flat honeycomb panels for test purposes in a "shake-down" run. ✓

W.K.

Request 1-page description of

- size

- capabilities

- planned R&D program

(common bulkheads?)

(Next NOTES) B

B7/12

* 1. SATURN I/IB: Prevalves for S-I & S-IB - The present normally closed (N.C.) Lox and Fuel pre-valves will be replaced with normally open (N.O.) pre-valves; On SAT I effective with S-I-10 and SAT IB effective with S-IB-1 (See Attachment I) *Thanks. Very fine explanation B*

S-I-5, IN-S Shipping Date - Earliest date has been delayed until 7-31-63. Present plans are to complete the S-I-5 for shipping by 7-15-63 and place in storage until the shipping date.

* S-IV-5 - Stage Schedule - The combined MSFC-DAC schedule agreed to in the July 8 meeting at SACTO established the date for the first hot firing attempt on 8-15-63. If a second acceptance firing is required, this would be made about 8-29-63. For launch scheduling purposes, the 8-29 date is the date being used for completion of the acceptance firing. This would allow arrival at AMR 4 weeks later, via "Pregnant Guppy," on about 9-26-63. The launch of SA-5 could be made 12 weeks later. *Oh, oh ... ✓*

RCA-110A Computer - Contract was reported last week as being held up in Washington based on questions raised by Dr. Shea. Information received from Hqs indicates Mr. Holmes has approved the contract as far as SATURN IB is concerned. ✓

2. SATURN V: S-IC Test Fuel Tank - Delay of 12 weeks, as reported in Notes 7-8-63 Lange, is not only caused by porosities in bulkhead to Y-Ring welds, but rather by an accumulation of many problems, mostly concerning late release of documentation by Boeing, which resulted in late tooling design releases and late delivery of components to ME Division. ✓

Information was received from Boeing of a labor dispute between the International Brotherhood of Electrical Workers, AF of L, Local Union Number 130 and the construction contractors at Michoud. This dispute has resulted in a strike called by the Union on 7-1-63. The immediate impact of this strike indicated generally a day for day slide in the scheduled completion of certain facilities within the S-IC area. There was no indication that this labor dispute affects overall Plan V schedules at this time.

*Harry Gorman
fyi B* S-II - S&ID will use the capacitance type propellant management system on the S-II-4 and subsequent stages. This system is presently under development by DAC for the S-IVB. S&ID will procure from DAC. ✓

Approximately 31 aft common bulkhead gores are in process in various stages of completion. Certification of the thick to thin welder located at the Seal Beach facility was accomplished and two weldments of waffle and thin-gore have been completed. ✓

All facility activities have been completed at the site of the electro-mechanical mockup and effort is continuing on the development mockup phase. ✓

CHANGES IN PRE-VALVES
FOR
S-I AND S-IB STAGES

Very clear. Thanks

B 7/18

1. The lox and fuel pre-valves will be changes on SATURN I, effective with S-I-10 and SATURN IB,, effective with S-IB-1. The present normally closed (N.C.) pre-valves will be replaced with normally open (N.O.) pre-valves. N.O. pre-valves have always been preferred from the propulsion system functional and flight standpoint. However, to date static firing and pre-launch pad safety requirements have dictated the use of N.C. pre-valves.

2. With a N.C. pre-valve in the system, a control system failure could result in the loss of a vehicle by closing the pre-valves and shutting off propellant flow to the engines. This is contrary to the "fail-safe" philosophy and does not meet crew-safety requirements.

3. To meet the requirements of both flight safety and ground safety (static and launch pad), M-P&VE proposed a N.O. Pre-valve with provisions for positive closing capability during static test and pre-launch in the event of loss of vehicle electrical power and/or vehicle control system pressure. This valve is shown in figure 1. This single piston actuator would close the N.O. pre-valve when control system pressure is supplied to the actuator through the N.O. (vent) port of the control valve.

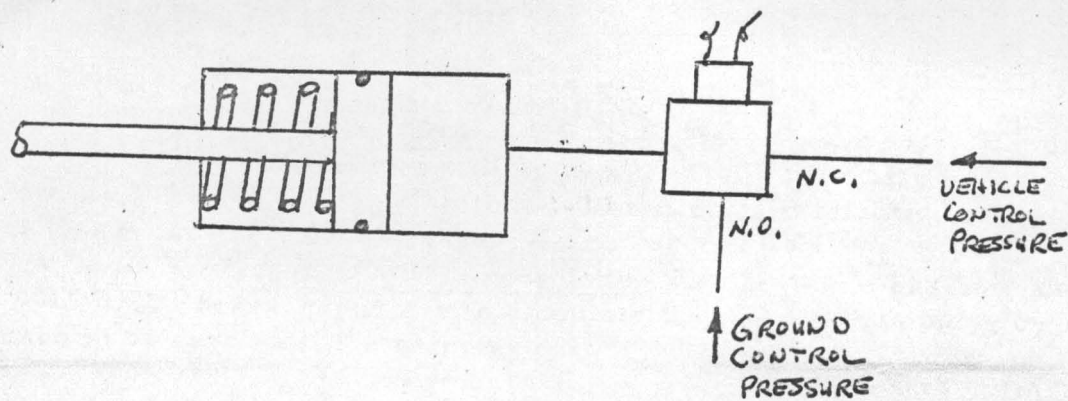
4. Figure 2 shows the system for the single piston actuators for N.O. pre-valves. As shown, the interface between the onboard control pressure system and the ground system is the pre-valve control valve. Normal closing of the pre-valves is accomplished by the onboard control pressure system. However, with the loss of onboard electrical system or vehicle control system pressure the pre-valve control valve would remain in the normally closed or venting position, providing a path for ground pressure to close the pre-valves. This, then gives the capability of closing the pre-valves with either a vehicle electrical and/or control pressure failure with a ground controlled system.

5. M-TEST is currently using the principle outlined for the single position actuator (figure 2) for controlling vent valves, emergency drain valves, etc., during static test to ensure positive control. M-TEST and M-LVO approved N.O. pre-valves modified with positive closing capabilities.

6. Vendor design development and preflight certification was scheduled to commence in March with completion by July 31. Flight hardware was scheduled to be available by September. Estimated development cost is \$100,000. Procurement action on these valves was late and hardware delivery has slipped into CY 64. The impact on S-I-10 effectivity for these valves is being investigated.

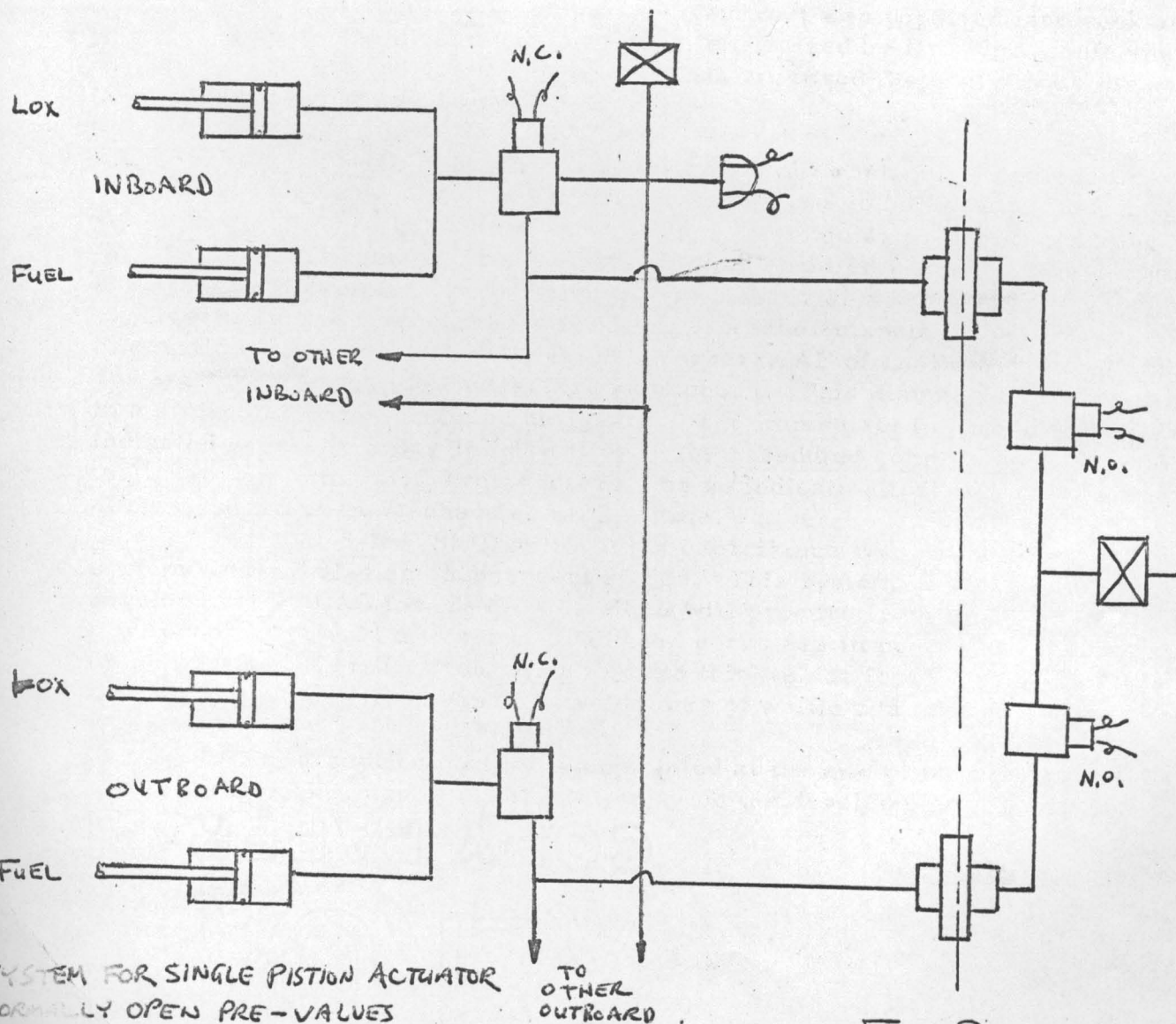
7. In summary, the N.O. pre-valve (modified to provide positive ground control capability) meets the ground safety requirements for redundant propellant flow cut-off capability. In flight, the N.O. pre-valve sacrifices some redundancy for propellant flow cutoff but increases the system reliability by eliminating a situation which could result in a pre-mature or an inadvertent propellant flow cut-off and subsequent loss of mission and jeopardy of crew.

Attachment 1



SINGLE PISTON ACTUATOR (N.C.)
FOR NORMALLY OPEN PRE-VALVE

FIG. 1



SYSTEM FOR SINGLE PISTON ACTUATOR
NORMALLY OPEN PRE-VALVES

FIG. 2

B 7/18

NOTES 7-15-63 MAUS

- *1. VALIDATION EXERCISE - The technical task force which visited MSFC last week was headed by Mr. Crobaugh from Office of Programs. Team members from Office of Programs were: Harold Oppenheim from Management Reports, and Joseph Malaga and Otis Redfield from Resources Programming. Representatives from OMSF were Norm Rafel, Lester Fero, Charles King, and Charles Koenig. The exercise was divided into two separate efforts:
- (a) Review of Saturn I and IB technical programs and schedules, and ✓
 - (b) Review of resources and cost estimating techniques and the basis thereof in the Saturn V and Engine projects. ✓

The meetings will be resumed tomorrow under direction of Bill Fleming from Technical Programs Office. ✓

- *2. OVERALL MSFC MANAGEMENT SYSTEMS REVIEW - Mr. Cadle heads the team which is also composed of Messrs. Haase, Velandar, Elliott, Croxall from Office of Administration; Messrs. Barber and Fillmore, Office of Programs. They were given presentations last week on:

MSFC Operating Philosophy and Management Structure (Dr. Rees)
PERT Applications, Line of Balance (Smith)
533 Reporting (Sharkey)
OMSF Scheduling and Review Procedure, and
Program Management Plans (Abbott)
Director's Review System (Andressen)
Manpower Utilization and Control (Rutledge)
MSFC Internal Financial System (Hardeman)
NASA PERT for Facility Projects (Crouch)
MTF Management Control System (Everitt)
FEO, Organization and Systems (Shepherd/Webb)
Procurement Reporting System (Cavalliere/Craig/Williams)
NASA PERT, J-2 example (Drummond)
Managerial Data Center (Kline)

The team returns tonight and will reconvene this review tomorrow. ✓

3. JULY MANAGEMENT COUNCIL MEETING - Wind Tunnel Testing in the Saturn Programs will be the subject of the Status Report Film for the July Management Council Meeting. In addition to this, we are also preparing an approximately five-minute highlight film report on various subjects. This will have no sound - we will furnish you brief comments for each scene. ✓

B 7/18

NOTES 7-15-63 MRAZEK

* 1. BLAST HAZARDS STUDY: The contract for the study of the blast hazards of rocket propellants by Edwards Air Force Base (EAFB) was finalized on 6-24-63. Personnel from EAFB visited MSFC on 7-8-63 and presented their overall approach to the problem. Several excellent suggestions for improvements in the program were included, and it was evident that the study is being undertaken with considerable enthusiasm. ✓

2. B-2 REACTOR COLD-FLOW TESTING: B-2 Reactor Cold-Flow testing, with gaseous helium, nitrogen, and hydrogen, was conducted on 7-11-63 at the Nuclear Rocket Development Station. Extensive data was observed by vibrational pickups, camera recording, and visual observations. Vibrations which have been seen in the B-4 testing were not observed. Testing will continue on 7-12-63 using liquid hydrogen. The B-2 core design does not appear to be susceptible to the same vibrational problem expected in the previous B-4 testing. ✓

* 3. SATURN PROPELLANT DISPERSION SYSTEM: Dr. Debus asked this division to investigate vehicle installation and compatibility of a "pancake" destruct system.

The "pancake" installation appears simpler than the destruct system presently employed, consequently, a reduction of vehicle on-pad time could result. The "pancake" destruct charge is a shaped charge located in a position to pierce the common bulkhead (upper stages only). No tests have been made to date and considerable effort would be necessary.

↑ W.M. Is "Pancake" also compatible with liquid explosives (see Gruene's NOTES 7-15-63, par. 1.?)
B

B 7/18

NOTES 7-15-63 RUDOLPH

No Notes

NOTES-7-15-63-SHEPHERD

B 7/18

No Notes

1. MANNED SPACE SCIENCE PROGRAMS: On July 9, Dr. Fryklund of OSS, and Major Andrews of OMSF, visited with members of RPD and Special Assignments Office (including Mr. Hueter), to informally discuss our participation in the activities of the Manned Space Science Programs Division, now being formed in OSS. This new division will be responsible for planning and developing scientific programs for manned space flight projects, scientific training of astronauts, and determination of qualifications and choice of scientist-astronauts. Therefore, this new division will also be responsible for approval of scientific packages on LLS payloads. The charter for this new division has been accepted by Mr. Holmes and Dr. Shea of OMSF, and Dr. Newell, OSS, and is now awaiting final approval by Mr. Webb. With the concurrence of Mr. Hueter, Dr. Hale of RPD has been named to be a liaison man with the new division. ✓

*2. NASA TECHNOLOGY UTILIZATION PROGRAM: Mr. Thompson of RPD made a presentation to the Kentucky Atomic Energy and Space Authority. This group is headed by the Lieutenant Governor of Kentucky. Mr. Thompson had lunch with the Governor and other members of the Authority. The group plans to visit MSFC at some future time. ✓

3. METEOROID MEASUREMENT SATELLITE: On July 11, personnel of the Space Thermodynamics Branch of RPD, P&VE, ME, and Armour Research Foundation met with representatives from Fairchild to discuss the thermal control problems of the meteoroid measurement capsule. It is planned to use the adapter and portions of the S-IV stage as a thermal heat sink for the electronic package, and to use a "thermal window" which sees only the adapter and S-IV. A special space-stable paint will be used on the outside surfaces of S-IV and the adapter to achieve a temperature as low as possible during orbit.

Several members of the Nuclear and Ion Physics Branch have been performing analyses of data pertinent to the effect of electron radiation on the capacitor detectors to be used in the meteoroid measurement satellite. No problems are evident, but the possibilities will be explored intensely during the next three months. ✓

*4. CHARGED PARTICLE SHIELDING: We appreciate the Headquarters request that you appoint an MSFC member to a committee to supervise the Oak Ridge National Laboratory work on charged particle shielding. ✓ This way of doing business removes us from the power politics involved in the ORNL attempt to gain control of the space shielding business and prevents the NASA centers from bickering over who should do the work. ✓

↑ O.K. Sta me. Please
E.S. recommend a man as
MSFC member B

B 7/18

1. J-2 ENGINE: Four short tests (two and four seconds) were conducted on Test Stand 2 to evaluate a thrust chamber-mounted diffuser. This diffuser was fourth configuration tested. Although it agrees with previously tested designs, results did not show improvement over configurations which have been tested. It appears that use of a short, 12- to 16-inch, thrust chamber-mounted diffuser will adequately solve the side-load problem during mainstage and cutoff. Development testing for refinement is continuing. ✓
2. H-1 ENGINE: Primarily, engine system testing of improved turbopump, stainless-steel thrust chamber, and low-fuel Delta-P injector has been conducted this period. ✓
3. RL10 ENGINE: Nineteen tests were conducted in the RL10-A-3 substantiation program, thus raising the total to 511 firings and 69,091 seconds. Eleven tests were conducted in the RL10-A-3 production support program; its total becoming 406 firings for 50,437 seconds.

A pre-negotiation of the follow-on R&D program was conducted on 7-8-63 with personnel from this Center and Pratt & Whitney Aircraft. The follow-on R&D contract will cover a two-year period starting 10-1-63.

Four "jumbo" tank cars of liquid hydrogen are being shipped to Florida Research and Development Center from west coast, and are expected to arrive before 7-29-63, extended date of the pending rail strike. This shipment will sufficiently bolster our propellant needs in Florida. There is a possibility that Air Force Plant No. 74 will be back in operation 7-18-63. ✓

- HW
Solution
in
sight?
B
- *4. F-1 ENGINE TESTING: One gas generator ignition test and four engine system tests were performed on engine 010 to evaluate the ablative nozzle skirt extension. The total run time on the skirt was 257 seconds with the longest duration being 125 seconds. During the 125-second test, the liner of ablative material was either blown from the skirt extension or was completely eroded away. Chamber damage was inflicted by the apparent high lateral nozzle loading during the test. ✓

- *5. F-1 INJECTOR TESTS: Three injector tests were conducted during this report period using center and off-center mounted bombs. Injectors X007 and 076 were tested in tube wall chambers. In one test a bomb failed to induce instability, however, in the remaining two tests, the bombs induced instability which was terminated by rough combustion cutoff. Chamber damage on one test was due to failure of the fuel inlet manifold. The other test had severe tube damage.

- *6. F-1 ENGINE LOX PUMP EXPLOSION: A LOX pump exploded during start transition, while undergoing component testing, causing considerable damage to the stand. The pump had accumulated 1700 seconds of operation prior to test. Four weeks will be required to repair Test Stand 2A. A tube was temporarily installed in LOX seal cavity between the seals for purpose of measuring pressure; this tube was adjusted on day of the explosion, creating possibility of misalignment. Further investigation is being conducted by Rocketdyne and specific findings will be reported. ✓

7. F-1 INJECTOR TESTS: (Reference NOTES 7-1-63 WEIDNER, paragraph 2, copy attached.) Primarily, (to date) center-mounted bombs have been used to induce instability on F-1 injector tests. It has been found that off-center mounted bombs will induce instability more often than center-mounted ones. The difference between the two bomb positions is not fully understood at this time. No conclusion can be drawn since an insufficient number of off-center mounted bomb tests have been made. Hermann, Some of your items (upper 3) need

Attachment #1: NOTES 7-1-63 WEIDNER

concluding remarks. spm

↑ I agree B

Question: What can I honestly say when people ask me: Where do we stand with the F-1?

July 29, 1963

Mr. Gorman
Mr. Newby, M-DEP-ADM

August 29, 1963

1. This note is submitted in response to Dr. Von Braun's August 2 comment on Dr. Stuhlinger's attached Notes dated July 29, 1963.

2. Within terms of the continuing resolution, all supporting research and technology programs are considered continuing effort. This interpretation applies to initiation of new tasks as well as to extension of existing supporting research and technology contracts, but does not apply to OART approved flight projects such as RIFT.

3. Our inability to initiate new SRT tasks within FY 1964 program authority and funds received under the continuing resolution results from reservation by NASA Headquarters of approval authority for all new tasks. Marshall has repeatedly urged that this restriction be removed. As pointed out in Dr. Stuhlinger's note, initiation of new tasks is indefinitely delayed as a result of the time consuming coordination required within Headquarters during the approval process. This office was advised by Mr. Eagle that FY 1964 task approvals were mailed this date by OART and that task approvals from other Headquarters Offices should be received by the Centers by the end of next week.

4. Our request to OMSF for First Quarter FY 1964 program authority did not include a requirement for extending FY 1963 SRT contracts. Expiring OMSF research and technology contracts referred to by Dr. Stuhlinger appear to be requirements for initiating advanced effort within certain tasks rather than actual work stoppages on these tasks. This office will take expeditious action to obtain program authority and funds to permit extension of these contracts. FY 1963 contracts within "Dry Lake" Saturn funding have already been extended.

5. Program authority received for SRT programs is indicated below, both current and as of July 29, 1963, the date of Dr. Stuhlinger's Notes.

<u>Hq. Program Office</u>	<u>P. A. Received A. O. July 29</u>	<u>Thru August 28</u>
OMSF	0	0
OART	\$4,160,000	\$4,160,000
OSS	570,000	570,000
OTDA	900,000	900,000
	<hr/>	<hr/>
TOTAL	\$5,630,000	\$5,630,000

T. U. Hardeman
T. U. Hardeman

Chief, Financial Management Office



August 29, 1963

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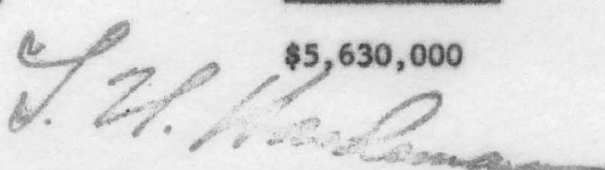
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T. U. Hardeman
Chief, Financial Management Office

B 8/2

NOTES 7-29-63 Stuhlinger

+ 1. FY-1964 SUPPORTING RESEARCH AND TECHNOLOGY: We have not yet received any official feedback from the FY-1964 MSFC Research and Supporting Technology Program submission to NASA Headquarters. The various MSFC tasks submitted are presently under consideration by OART, OSS, OMSF, and OTDA. Previously, Dr. Bisplinghoff estimated that Headquarters review and approval of the FY-1964 research tasks submitted by the Centers would be completed before July 1. This was obviously an overly optimistic estimate because of the vast amount of cross coordination that must be effected between OART and the other Headquarters Program Offices under the new and involved research task approval operation. At the present time we do have ample funding to cover extensions of OART research contracts expiring in the first quarter of FY-1964. FY-1964 program authority has not, as yet, been provided to continue expiring OMSF research and technology contracts. ✓ Musig 9.

Has about the famous continuing resolution? Doesn't it apply in this case?

This off-and-on business with these small research contracts is more than anything else. B

Extract from v. Braun Notes 7-29-63

Not for further distribution.

Also ask Hardeman to prepare an answer to VBr question on item 1 of Stuhlinger's notes

B 7/31

*1. INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS (IBEW) -
SOUTHERN LOUISIANA CHAPTER OF ELECTRICAL WORKERS

The strike is now in its 29th day. Chrysler and Boeing inform us that if the strike continues it will have a critical effect on schedules. Paul Styles and John Miraglia are doing everything possible to expedite a solution to the dispute. ✓

2. LVO D PERSONNEL VISIT

Approximately 35 personnel of LVO D headed by Dr. Hans Gruene visited Michoud Operations on Tuesday, July 23, 1963. A review of S-1, S-1B, and S-1C activities was conducted and problems peculiar to Cape operations were mutually discussed by NASA and contractor personnel. ✓

3. VISIT OF NASA HEADQUARTERS PERSONNEL

Two groups of NASA Headquarters personnel conducting surveys of MSFC programs and activities are scheduled to visit Michoud Operations this week. The first group primarily interested in program activities, schedules and operations, plan to review Michoud Operations activities beginning Tuesday, July 30, 1963 and departing Wednesday, July 31, 1963. This group consists of Messers. Crobaugh, Smith, Mitchell, Maggin, Angell, Kafka, Koutsandreas. Mr. Andressen, MSFC Central Planning Office will accompany them to Michoud. The second group interested primarily in purchasing and contracting will arrive Wednesday, July 31, 1963 and will depart Thursday, August 1, 1963. This group consists of Messers. Cadle, Croxall, Velandar, Stevens. Mr. Harry Gorman will accompany this group to Michoud. ✓

4. FIRST QUARTER FY-64 REVIEW

The first FY-64 quarterly review for S-1 will be held at Michoud Operations in New Orleans on August 13 and 14. ✓

5. S-1C INTERTANK AND "Y" RING STATUS

The Boeing Company is completing the one-half intertank section that is to be fabricated to the "Y" ring and shipment of the intertank to Huntsville is anticipated in the near future. "Y" ring number 3 has been through final x-rays, florescent penetrate inspected, cleaned and etched. Packaging is scheduled for the first of this week. "Y" ring number 4 is on the boring mill and in the final cut stage. ✓

*6. S-1 CHECKOUT STATION

Build-up activities in checkout station is now in progress. The central computer and the facility test station have been installed and cabling and checkout is continuing. Quality personnel are monitoring the installation of the entire complex. ✓

B 7/31

NOTES 7/29/63 DAVIS

*1. NASA Work at Douglas Aircraft Company: Mr. Lingle of ^{from} Headquarters has asked for a comprehensive analysis of the impact of cancellation of Skybolt on NASA work at Douglas. The analysis was started last week and should be completed some time next week. ✓

*2. Negotiations with Douglas: Negotiations were held with ^{from} Douglas Aircraft Company on July 18 and 19 to derive an agreement on construction of Tooling Tower Complex at Huntington Beach for S-IVB. DAC has agreed to provide the financing to cover a portion of the Complex estimated at \$1,561,077, with title of ownership to remain vested in the contractor. Costs chargeable directly to the program for MSFC financing are \$640,989. One point not agreed upon is the recognized rate for depreciation of the structure since Douglas wants eight years, and it is doubtful that this short period is acceptable to Internal Revenue Service. This last remaining item of the Huntington Beach relocation problem should be resolved within five days. ✓

BD
So many
taxative
proved
effective?
B

OFFICE OF DIRECTOR - MSFC

CODE	NAME	INIT.	<input type="checkbox"/> A <input type="checkbox"/> C <input type="checkbox"/> T <input type="checkbox"/> I <input type="checkbox"/> O <input type="checkbox"/> N	<input checked="" type="checkbox"/> INFORMATION
M-DIR	Dr. von Braun			

REMARKS

With respect to your notation on Item 4 of Captain Fortune's Notes, 7-29-63 (attached), as you know, there are no Negroes presently on the government rolls at Mississippi Test Operations or Michoud.

I believe Bill Fortune understands the implications of the Equal Employment Opportunity program and Mr. Webb's position in this matter. To date, only one Civil Service examination has been held for MTO job openings. This was for Clerk-Typists and was held in government facilities at MTO to assure that testing could be conducted on an integrated basis. Word of this examination was passed on to the local Negro educators and leaders and they were asked to encourage their qualified people to take the examination. As a result of this, two young Negroes who had college backgrounds took the test; however, they failed. They were encouraged to take a subsequent test, but failed to appear.

Our personnel people have been in contact with the Negro colleges in New Orleans and discussed job opportunities at both MTO and

OFFICE OF DIRECTOR - MSFC

CODE	NAME	INIT.	<input type="checkbox"/> ACTION	<input type="checkbox"/> INFORMATION

REMARKS

Michoud. Bill Fortune, in addition is sending a man from his staff to visit the placement people at Dilliard and Xavier to advise them of those jobs that will be open at MTO during the course of this academic year.

With respect to Michoud, the possibility of coming up with qualified Negro applicants for engineering and contracts work looks somewhat dim; however, the prospect of obtaining qualified clerical help in New Orleans is much better than across the State line. George Constan appears to be maintaining amicable and cooperative relationships with the Urban League.

I have arranged for our personnel people to meet next week with MTO and Michoud to help them with a good over-all plan.

CODE M-DEP-ADM	NAME Harry Gorman	DATE Sept 6, 1963
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1. Many Visitors to MTO: Life at Gainesville is not as quiet as I had envisioned. In addition to many local persons calling, we have had the following visitors:

- a. Bob Long and Jim Shepherd on construction matters.
- b. General Barclay, USA, Retired, orientation.
- c. Congressman James Morrison, orientation.
- d. Dr. Peter Dodd, American Academy of Arts and Sciences on social impact.
- e. Carroll Towne and M. Kent on community development.
- f. Dr. Harvey Hall, orientation (Dr. Abe Hyatt who was to accompany him cancelled because of plane trouble).
- g. Messrs. Jim Kincannon and Hale, IT&T on possible work for Aetron. ✓

*
9:00 2. Construction Accelerating: 180 construction personnel and 30 Corps of Engineers personnel are on board this a.m., and will be augmented daily as a dozen of construction jobs pick up speed. ✓

3. GE Status: Thirteen GE employees are making good progress to provide us necessary starting support by August 1, 1963. They will add about three persons a week for the next month or so. Signed contract has not yet been received from NASA. ✓

4. Called on Maj. Gen. Hardy, Keesler Air Force Base: Friday morning I called on General Hardy to thank him for assistance that his Personnel Department are giving on filling out Civil Service applications and to discuss mutual areas of interest. Newspaper articles on the Gesell Committee report on integration efforts by local military commanders have caused a great deal of concern about Keesler Air Force Base operations. It is premature to determine their effects on our programs. We are working with local community leaders in emphasizing equal employment opportunities for all. ✓

Harry Gorman

What ^{specific} actions have we taken to implement the equal opportunities program at MTO? Here in Huntsville some very energetic steps were taken and reported to Mr. Gidd. How about down here? And in Midland?

B

- *1. Special Fluid Mechanics Facility: On July 16 Aeroballistics personnel met ^gwith Langley personnel, including the Acting Director, Mr. Donlan, and members of his technical staff. Purpose of meeting was to discuss our proposed special fluid mechanics facility. Our presentation was well received and Mr. Donlan commented that Langley policy was not to quarrel with proposed facilities of other NASA centers. He agreed that our problems were peculiar to large launch vehicle development such as Saturn and stated that if MSFC did not do the work, it probably would remain undone since no other agency has this responsibility. He added that MSFC needs the in-house capability to fulfill its mission and that Langley could not do the work since they do not have the facilities required for the model size and operating characteristics. He stated that they would continue to assist us in our more conventional wind tunnel testing work. Mr. Donlan clearly understood the object of our presentation, and our representatives feel that we accomplished our objective, in that we have the moral support of Langley for our FY-65 facility request. ✓ *Any help I can give at this time? B*
2. Micrometeorite Experiment: A summary of the present payload capability of SA-9 and SA-8 (micrometeorite experiment) was given at the in-house status review presentation on July 24. In this presentation it was pointed out that the vehicle has the capability of placing the 4,000 lb. (including support structure) micrometeorite experiment into an elliptical orbit with a 400 km perigee and a 1,160 km apogee. Lifetime estimates indicate that this should give a -2σ lifetime of about 415 days. ✓
3. Project LIEF: Formal transmission, through Dr. Rees' office, of the summary of Project LIEF including a detail cost estimate based upon the original Project LIEF was effected on July 22, 1963. ✓
4. University of Kentucky Space Flight Seminar: A Space Flight Seminar, sponsored by the Kentucky Research Foundation and the University of Kentucky is being held July 22 through August 2 at Lexington, Kentucky. Main topics to be presented are Advanced Mathematical Theories and Methods used in Space Flight problems. Five Aeroballistics' people will make presentations as follows: (1) Special Perturbation Methods of Space Trajectory Computations, (2) Applications of Calculus of Variations to the Shaping of Space Trajectories, (3) The Mechanics of Trajectory Simulation, (4 & 5) Simplified and Sophisticated Models of Lunar Trajectory Studies. University of Kentucky professors will also make presentations. This is an example of the close cooperation which exists between NASA-MSFC and southeastern universities in the area of space flight scientific development. ✓✓

B 7/31

1. 34 and 37 Facilities Scheduling: In a meeting on July 16, 1963, M-SAT and LOC briefed Mr. Holmes on present Block I schedule and utilization of Pads 34 and 37. It was decided that wet test on 34 will be performed with the S-1 and S-IV-D stages instead of S-IV-6 as proposed in the last Management Council Meeting. This brings the facilities schedule back to the original plan. ✓

2. Automatic Checkout: In discussions with Astrionics and Quality Assurance Division personnel on the GE programming exercise, I detected an almost complete lack of coordination in the automatic checkout area. Since LVO will be faced with both systems (low and high bay checkout) it is felt that the closest cooperation between the MSFC divisions concerned is mandatory. I hope a try to get design people together during this week will be successful, otherwise GE, which must be aware of this fact by their personnel working in this area in the two divisions, has good justification to step in. *within MSFC qcm*

3. Visit to Michoud: A group of LVO test engineers, utilizing the 404 aircraft, visited Michoud Operations on July 23. Discussions with Chrysler revealed that no plan is advanced to include automatic features in the S-1B specifications. This is necessary for checkout at AMR. Boeing stated that there were no provisions for working platforms for S-1C in any vertical checkout in their contract. M-SAT was informed.

→ Mac + Hans Gruene + Neubert

Please see me on this, at your earliest convenience
(together)

B 7/31

B 7/31

1. S-I-6: During the post-static inspection of the S-I-6 Stage, twenty-eight MC-125 steel sleeves were found cracked. An investigation is in process to determine the cause for the increase in this type deficiency, and determine if the material meets requirements of MSFC-SPEC-145A. ✓

2. S-I-7: The pre-static testing of the S-I-7 Stage continues on schedule and no major discrepancy exists at this time. However, due to the number of mechanical systems reworked since pressure and functional testing, retesting of affected systems is considered necessary prior to release for static test. ✓

3. S-II: In compliance with your request for more details (NOTES 7-1-63 GRAU, copy attached), a copy of the proposal to Saturn Systems Office is enclosed for your perusal (Attachment 2). In summary, the Quality Assurance Division proposed a different approach to the final checkout problem by the use of a two-bay combined electrical/mechanical vertical checkout building with a centrally located control room for both bays. The existing concept is for a single station horizontal checkout building for only the mechanical systems, including painting and packaging. Electrical performance testing will be accomplished in the manufacturing building under this concept, with no flexibility in case of problems. Dr. Lange informed this Division on July 10, that the Saturn Systems Office intends to include requests in next year's budget to reorient this facility according to our recommendations. However, this proposal by Saturn Systems Office seems only to postpone the problem until later and at considerable increase in cost.

Good
Lange
Request
Comments

B
(What
kind of
money
are
we
talking?)

*4. MICHOUD CHECKOUT COMPLEX: Installation of equipment in checkout complex no. 1 at Michoud Operations is on schedule and no major problems exist. The Packard Bell Instrumentation and Telemetry, Networks, and Vehicle Test Stations are installed and undergoing final acceptance tests. The central computer complex is presently being installed. ✓

*5. NEW NASA QUALITY ASSURANCE DOCUMENT: This Division has been requested to participate in the formulation of a new quality assurance document containing guidance to NASA installations in requesting, utilizing, and evaluating performance of government quality assurance functions at contractors' plants. Guidance to the government inspection agencies complying with NASA Publication NPC 200-1, "Quality Assurance Provisions for Inspection Agencies," will also be included in the new document. ✓

6. NASA-AIR FORCE FIELD SUPPORT AGREEMENT: This Division assisted NASA Headquarters in reviewing a proposed revision to the basic NASA-Air Force Field Support Agreement. The proposal was prepared by the Air Force to provide, among other things, reimbursement by NASA and to be more specific in duties performed. In the opinion of the reviewers, certain provisions would hamper NASA in securing full support in a manner satisfactory to the requesting NASA installation. Several recommendations to strengthen the NASA position were made. ✓

2 Enc:

1. Attachment 1 (NOTES 7-1-63 GRAU)
2. Attachment 2 (M-DIR only)

B 7/31

*Ernst
Stuhlinger
f info
& comments
B*

1. MICROMETEOROID PROJECT: Our MMP support exceeds by far the anticipated amount of work. Continuation at the present rate will result in slip of other schedules. Three particularly serious trouble examples are the antenna, command decoder, and solar cell and battery power supply system. Our personnel must participate for solution. In the last three weeks, six of eight TDY's for MMP had to be carried out on short notice requests from M-RP.

Freitag

*2. STATUS OF IBM CONTRACT ACTIONS: The contracts situation with IBM is SERIOUS. The Advanced Guidance Computer and the Data Adapter contracts still have difficulties. As a result it seems impossible to use the new components in 201. This will require the use of different components and schemes in the IU layout and instrumentation system, resulting in less flight testing for the Saturn IB and V guidance and control system. The IU contract is in even worse condition. We have information from Mr. Nickalas of Captain Freitag's office that they will return the procurement plan as rejected; we do not know yet the details.

*RUSH
Mr. Ferguson
SAT
Please bring this to immediate attention of Charlie Able or Jack Bromberg and let me know what transpired
B*

3. S-IV-5 QUALIFICATION TEST PROBLEMS:* The following is a report from Mr. O. L. Smith of the Instrumentation Development Branch: A personal visit to DAC at Tulsa, Okla., facilities revealed that there is a distinct lack of interest and enthusiasm for the qualification test of S-IV-5 flight components. There are approximately 20 items to be Q.T. at DAC/Tulsa. Of these, only a couple have been completed. It was disheartening to find no test in progress at Tulsa. Those people do not have any feel of urgency concerning the whole Q.T. program. There seems to be very little close communication between the test people at Tulsa and at Santa Monica. I strongly recommend that the Q.T. work on the S-IV-5 components at Tulsa be returned to Santa Monica.

4. STATUS REPORT - ELECTRICAL SYSTEMS DESIGN INTEGRATION WORKING GROUP:* Attached is a synopsis of the items discussed in this working group's 16th meeting, 7/9, 10, 11.

5. THREE SEPARATE VEHICLE INSTRUMENTATION WORKING GROUP MEETINGS:* (Reference item 5, notes of 7/1, copy attached.) Per your request, additional details of these meetings are provided in enclosure #3, Status Report - Vehicle Instrumentation Working Groups.

*Advance copies of these items were forwarded to M-SAT/Dr. Lange, 7/24.

3 Enc:

1. Report of Elect Systems Design Integration Working Group
2. Notes of 7/1
3. Report of Vehicle Instrumentation Working Groups

STATUS REPORT July 22, 1963
ELECTRICAL SYSTEMS DESIGN INTEGRATION WORKING GROUP

The 16th Saturn I meeting of this group was held on 7/9/63 and the 7th Saturn V meeting on 7/10 and 7/11. Some of the more significant agenda items were:

1. DAC stated that they did not want to modify their interstage connector mounting bracket design and automatically disconnect to simulate separation during overall test. MSFC agreed that the DAC design not be modified. M-SAT was requested to direct all Saturn V contractors to use DAC's approach on the S-IV stage. M-LVO will provide this disconnect capability in the VAB.

2. No firm directions have been given to the stage contractors on the Emergency Detection System (EDS); however, EDS meetings are planned for 7/16, 17, and 18 with MSC. Firm directions may result from these meetings.

M-SAT was requested to direct NAA to continue with EDS studies but discontinue EDS design until parameters have been established.

3. The dual checkout capability proposed by DAC involving equipment sharing (scope changes 1032 and 1034) does not provide enough additional checkout capability to warrant implementation and is opposed to MSFC methods of operation. As a result it was decided that: (a) DAC should design their factory set of GSE to mate one checkout station with the capability to connect to either of two cells and (b) M-SAT should review existing schedules to see when or if a second checkout station is required at factory checkout and/or AMR; if required, a second set of GSE (excluding R.F. and telemetry ground stations) should be funded for these locations.

4. The Electrical Working Group recommended the use of Contained Detonating Fuze (CDF) for retro-rocket ignition on the S-IVB aft interstage of Saturn V and EBW ignition system for ullage rockets and aft interstage retro rockets on S-IVB, Saturn IB. The Mechanical Working Group should study this problem and determine which system is to be used.

5. An EBW splinter meeting was held to discuss:

- a. Directions to stage contractors for EBW systems monitoring ----- this was given in the form of a handout which will become part of the minutes.
- b. EBW component requirement schedule ----- This schedule will be released by the Electrical Working Group through M-SAT.

Enc 1 (notes of 7/29)

- c. EBW documentation for the detonator, detonator test chamber, safe and arm device and firing unit test set will be available by the first week in August.

6. M-LVO wants to use flight type batteries for one overall test; it was agreed that a memo would be written to M-SAT requesting that each contractor be directed to supply flight type batteries for one overall test of the first three live stages of Saturn IB and Saturn V.

STATUS REPORT
VEHICLE INSTRUMENTATION WORKING GROUPS

July 22, 1963

1. S-IC: A recent meeting of the S-IC Vehicle Instrumentation Working Group was held 6/27/63. MSFC representatives presented the status of telemetry documentation scheduled to be delivered to The Boeing Company. There were a few minor discrepancies between MSFC and Boeing records with respect to drawings transmitted versus drawings received. MSFC agreed to provide additional copies to replace Boeing's shortages. Boeing requires drawings of the Vibration Multiplexer by 8/24/63, and these drawings are not scheduled to be released until 10/1/63. MSFC agreed to attempt to provide pre-released drawings before 8/24/63.

a. Boeing presented design, development, and procurement status utilizing MSFC provided documentation. The presentation was divided into three parts and highlights from each part are as follows:

(1) Overall interface between airborne and ground - The interface problems appear to have been solved and MSFC personnel agreed that the design approach as presented is technically acceptable.

(2) Details of the airborne system - Details of each of the telemetry links were presented along with typical examples of procurement specifications and specification control drawings. Details on the contents of Boeing generated specification control drawings, and manner of incorporating MSFC provided drawings into the procurement package, were explained. Release dates for engineering data from Boeing Engineering Department were presented and it appears that these dates will be met to allow initiation of procurement actions on schedule. The system design and manner of utilizing MSFC supplied documentation are technically acceptable.

(3) Details of ground station - Although this area is primarily not a responsibility of this working group, some detailed data is of interest in order to insure that there are no air-to-ground interface problems. Quality Assurance Division personnel present were questioned as to technical adequacy, and it was agreed by all MSFC representatives present that the design, as presented, is technically acceptable. Although the schedule for release of design data for procurement is very soon for some items, it appears that all requirements will be met.

b. The chairman questioned the Boeing Company's attitude toward the acceptability and capability of MSFC developed telemetry systems for use in the S-IC. Boeing stated that the systems do satisfy the needs of the measuring program, as we know the requirements to be at this time. There are possibly other ways in which the requirements could be satisfied; however, they would all have problems which could not be forecast. In general, Boeing at this time does not know of any other way to solve the instrumentation program requirements than through the approach being taken.

Enc 3 (notes of 7/29)

2. S-II: A meeting of the S-II Vehicle Instrumentation Working group was held 6/27/63. MSFC presented the status of the telemetry documentation and the status of the delivery of same, as seen from this end of the tube. NAA, S&ID was in agreement with the status as presented, except for one item, and the drawings missing from this item were given to their representative the afternoon of 6/28/63. With the delivery of these documents, the only things missing are the printed circuit masters which will be delivered on a schedule agreed on in the meeting. North American then gave a presentation outlining their status in the utilization of the MSFC documentation and their plans for the use of these items after purchase. MSFC agreed with the technical approach of NAA and made a few suggestions concerning impedances, etc. It was also strongly suggested that NAA purchase telemetry equipment in blocks so that changes, due to technical advances, could be more readily and expeditiously implemented.

3. S-IVB: A meeting of the S-IVB Vehicle Instrumentation Working Group was held 6/26/63. A presentation was given by MSFC on the telemetry documentation provided to DAC. From this presentation, agreements were made that in the near future, Qualification Test Reports of Telemetry Systems and two additional drawings of the calibrator schematics will be transmitted to DAC. Other items were in agreement with DAC

The status of the design of the instrumentation system for both Airborne and Ground and the usefulness of the documentation furnished by MSFC to DAC was presented by a DAC Representative. The basic design of the telemetry system is satisfactory and there is no emergency at this time. It was agreed that the nomenclature used by DAC will be changed to that used by MSFC.

Douglas Aircraft was given technical approval to assemble the FM/FM Airborne system and the PCM/DDAS ground equipment, but final approval will come from Saturn Systems Office.

Again the requirement for coordinated development of Saturn telemetry for Vehicle System compatibility was emphasized. Douglas is to advise MSFC of changes which will effect functional interchangeability of telemetry systems.

B₂/2

NOTES 7/29/63 HEIMBURG

1. MTF WORKING GROUP:

X
sgm MTF Liquid Hydrogen Plant Request for Quotation package forwarded by M-P&C to prospective bidders on July 18. Pre-proposal conference scheduled August 5, with proposals due in by September 17.

North American S&ID interpretation of S-II manual static firing GSE (C7-800 series) with relation to local/computer control was presented to M-TEST, M-ASTR, and M-QUAL, July 16. The concept presented was favorably accepted, but it was recommended that:

a. The manual firing equipment power supply be wholly isolated from the local/computer control equipment power supply

b. That hot firing gimbal control be by GFE programmer, not by automatic checkout computer.

A revised procurement plan for Phases II and III of MTF technical systems has been prepared by M-P&C and the MTF Working Group for submittal to Headquarters. This plan proposes competitive procurement for all resulting contracts with GE participating therein through the working group.

As of today, GE has a total of 12 technical personnel assigned to the Working Group. This compares with a planned level for August 1, of 17. ✓

* 2. S-IV, DAC/SACTO:
sgm

Minor defects still prevent obtaining a completely clear sequence and abort check. The established ground rule is to obtain at least one and preferably two prior to turbine-spin test. If turbine spin test can be performed this week, static firing can possibly be conducted sometime next week, if no major difficulties arise. ✓



B 8/2

NOTES 7-29-63 HOELZER

1. LUNAR LANDING SIMULATION PROJECT: A plan for performing the first phase of this project with Civil Service personnel has been developed in accordance with your directions following the joint presentation by M-COMP-S and M-ASTR-A on July 2, 1963. We have also made some minor hardware changes which should result in a lower cost for the first phase. ✓
2. ENGINEERING AND TEST SECTION: The chief of this section, Mr. Charles L. Riley, has been released at his request to accept a position in Astrionics Division. His transfer was effective July 28. Mr. Riley was a key section chief in this branch and will be extremely difficult to replace. ✓
- *3. CONTRACTOR SUPPORT: In a meeting with Mr. Gorman on July 15, we were ordered by Mr. Gorman to put the General Electric contract out for open competitive bidding this year. Accordingly, a scope of work has been written and submitted to P&C.

gun

A meeting of GE managers, supervisors and project leaders was held on July 17 to inform GE people of the NASA decision to put the Huntsville Operation contract out for competitive bids in 1963. The objective of the meeting was to counter rumors that had begun and allay any fears of current employees concerning the future of the operation and their positions.

All possible efforts are being made to keep the force together and operating effectively through the period from now until a new contract is signed. ✓

B₂/2

NOTES 7-29-63 HUETER

1. APOLLO LOGISTICS SUPPORT SYSTEM (ALSS): A letter was received from the OMSF Systems Office outlining the Headquarters' tentative planning for the Lunar Base studies in which they feel my office will have a substantial effort.

Mr. Francis Evans and Mr. Edmond D. Messer went to OMSF on Wednesday to discuss the Lunar Base planning in addition to the letter that was received on July 12 relative to the Apollo Logistics Support System (ALSS) planning. The planning schedules within the two letters overlap and it was apparent from the discussion with the OMSF personnel that the two letters were uncoordinated. Considerable clarification was obtained with regard to the tasks assigned to MSFC and the proposed schedules. As a result of the discussion and the revelation of the overlapping schedules, Mr. Evans' group has the task of preparing a realistic over-all schedule for submission to and review with Headquarters at an early date.

The Engineering Support contract with Northrop Space Laboratories was negotiated on Monday, July 22. The contract is to be signed with an effective date of August 1. Mr. Evans has discussed with General Barclay the interview of prospective Northrop people to be brought on board as soon as the contract is signed. ✓

2. SATURN/3RD STAGE: Reference your question to my Notes of 7-15-63, "Is Centaur still in serious competition with MMM for this job," very basically it is anticipated that the Centaur feasibility study for Voyager applications will provide the Office of Space Sciences with documented data showing the non-feasibility of using a Saturn 1B/Centaur for the Voyager mission. OSS wants to have such information just in case they are ever confronted with the question, "Why didn't you use Centaur?" ✓

This office, together with the Marshall divisions, has outlined a program for FY 64 which would permit Marshall to be ready with a rather complete preliminary design of MMM by the end of FY 64. This program was generated in support of the 5 million dollars I requested from Dr. Lee, OMSF, for this purpose. ✓

1. APPROVAL OF CONTRACTOR SELECTION

Mr. Holmes has recently directed that his or Dr. Shea's approval is required for each contractor selected for an advanced system study. I have checked the background of this action with Doug Lord. It is not our fault. The trouble was with Langley and Houston in the selection of space station studies. Because this requirement is another burden and time delay, we do not like it too much. I have also discussed the situation with Max Faget over the phone. They will probably not fight it too much, because they were caught. I have drafted a reply to Mr. Holmes and sent it to Dr. McCall, Dr. Hueter and Dr. Stuhlinger for comment. We should have the final letter drafted for your signature next week. We are suggesting an alternate procedure which seems to be an acceptable compromise. ✓

2. FY 1964 ACTIVITY STATUS

I understand that there is a letter on its way to you from Mr. Holmes regarding the following on the Center's system study program:

- a. Study funding guidelines for FY 64
- b. List of studies which are to or have been approved by Seamans
- c. New reporting process
- d. Coordination requirements

To the best of my knowledge, the money situation isn't too bad (i.e., we may get about 70 to 80% of what was requested); however, it is too early to tell how we made out on specific studies. The reporting system which will be proposed, in the letter, is level 4. This will be an added burden on the Center because we have never been required to submit in this detail before. Such depth could be given and is in keeping with other approved programs; primarily hardware, however. In the coordination area, I feel that a single point (office) contact should be established and that this office (individual) should be responsible for the overall reporting. In view of our (FPO) job for the Center, I feel that FPO should assume these responsibilities; therefore, I volunteer for the job.

HHK

If this isn't contested by another division, you have it. If it is, let's discuss it next Board meeting.

B8/3

*1. Saturn V, S-IC Stage:
gm

We have made an assessment of the present status of the S-IC manufacturing program including a forecast for the most important milestone in the next future, i. e., the delivery of S-IC-T to Test Division. We arrived at this assessment jointly with the Boeing manufacturing people. In the last S-IC Review Meeting in May Boeing stated and went on record that the design release was up to 18 weeks in delay in some areas and that some of the delay could be recovered in manufacturing so that the affect on S-IC-T would be approximately an 8 weeks delay. ✓ Since May some additional slippages have occurred in the area of component manufacturing which seem not to be recoverable. Two major events are affecting the schedules:

a. Delivery of outlet fittings for bulkheads for S-IC-T has slipped from May 13 to the middle or end of August, caused by (1) a change of design specifications from ring forgings to closed die forgings, (2) rejection of all forging material from Alcoa to Wyman Gordon (who is producing the forgings), and (3) by a change of quality control requirements for the forgings. ✓

b. Delivery of lox tunnels for the fuel test container has slipped from July 8 to September 23 and for S-IC-T from September 23 to November 25 caused by breakage of the mandrel for extruding these tunnels at the Parson Company. ✓

There are a great number of other factors contributing to the overall delays such as difficulties in forming of acceptable gore segments, chemical milling of the segments, excessive warpage of segments after welding of outlets (in-house), porosity in horizontal welding (in-house), fabrication of ring baffles at Wichita which slipped from April 22 to July 29 because of late documentation, etc.

Our conclusion from evaluation of all the facts is that the S-IC-T will be approximately 12 weeks in delay. We believe that we have presently no manufacturing problems for which solutions have not been found and that we have explored and applied all possible means of minimizing the affects on the program schedule. ✓

2. Facilities: Attached is a short description of the Bonded Structures Facility and the planned R&D program for this facility, as requested. ✓

Mr. Kuers: This attachment is a little too much.
gm

Description of Bonded Structures Facility

1. The bonded structures facility located in Building 4707 of the Manufacturing Engineering Division comprises a special room for prefabricating of parts prior to bonding, a cleaning and etching line, a primer spray booth, a humidity and temperature controlled room for layup on bonded structures and a curing room wherein the autoclave is located. The autoclave is equipped to accommodate two platens 96" x 128". Platens are loaded into the unit by a hydraulically operated platform lift. Close tolerance in both temperature and pressure is possible by means of automatic controls. All facilities, including the autoclave, are sized to fabricate sandwich parts of flat and contoured panels 7' wide by 10' long, and cylinders up to 6' O.D. by 10' length. Elliptical domes up to 6' in diameter could also be bonded.

2. This facility will be principally used to advance the state-of-the-art in adhesively bonded structures of aluminum, plastic, stainless steel and possibly some of the exotic materials. For this reason, the autoclave is designed to operate at conditions of 200 psi and 500°F. Present state-of-the-art conditions for adhesively bonded structures are usually about 100 psi and 350°F.

3. Work orders have been issued for the following R&D programs:

- a. Honeycomb vibration test panels for M-P&VE-SE.
- b. Fabrication, test, and evaluation of 286 panels for establishment of manufacturing process requirements and limitations, and to develop a confidence level in bonding techniques.
- c. Fabrication of test panels for Quality Assurance Division for development of quality control techniques.
- d. Fabrication of a number of test panels using various adhesive systems to improve processing techniques and establish bonding integrity of these various systems.
- e. Fabricate full scale segmented test panels for the S-V instrument unit for structural testing. The project requested by M-P&VE-SB.

4. Ten people will be employed in this facility. ✓

W.K.
Suggest you
get in
touch with
Billy Mozek
on a
comprehensive
program of
experimenting
with different
common
bulkhead
manufacturing
(and inspection)
procedures
B
(He has some
very definite
ideas in
this field)

Have signed it for MSFC B B8/2
NOTES 7-29-63 LANGE

- * 1. SATURN I: The procurement plan for the CCSD reliability effort has been approved by Dr. Dryden on 7-19-63. This plan was submitted to NASA Hqs. ✓
- * SATURN IB: The RCA-110 contract was returned by Dr. Seamans to OMSF for additional sole source justification. No predicated date for approval is available. The launch date of SA-201 will be jeopardized if approval is not obtained by 8-15-63. ✓
 - S-IV-5 - SACTO Status - Sequence and abort checks on 7-26 & 27-63 necessitated several wiring changes. A pre-countdown meeting is being held on 7-29-63 to discuss a possible turbine spin. ✓
- 2. SATURN V: S-IC-T - Design releases are 16 to 18 weeks late. Follow-on hardware fabrication has recovered to about 8 to 10 weeks delay. Boeing will present to MSFC a complete S-IC-T program review including a program milestone schedule on 8-6-63. ✓
 - S-IC - An informal MSFC/Boeing meeting was held on 7-24-63 to discuss the transfer of the MSFC S-IC structural test responsibility and the mechanical impedance testing of the LOX suction ducting to Boeing. The Scope of Work is being prepared by MSFC/Boeing and is expected to be completed by 8-9-63. ✓
 - * S-II - The \$2.5 million required in support of the facilities construction effort at Seal Beach has been obligated to the U. S. Navy. ✓
 - The backup bulkhead program for the S-II Stage is proceeding on schedule. The original direction to the contractor required the fabrication of at least one common bulkhead by this technique. However, due to the possible schedule compromise in the fabrication of the primary configuration, the ME Division recently requested M-SAT to limit the backup bulkhead effort to the fabrication of all components required. ✓
 - * S-IVB - Negotiations on estimated cost for design, development, and delivery of four S-IVB stages (less TM) for the R&D portion of the SATURN IB program have been completed. Agreement was reached on an estimated cost of \$50.2 million. Fee negotiations are currently underway. ✓
 - Hydrostatic testing of the battleship tank is scheduled for August 5. ✓
 - * Instrument Unit - Contracts for the design, development and production of the prototype Environmental Control System water boiler were negotiated with Fairchild Stratos (NAS8-11538) for \$148,793 and with Hamilton Standard (NAS8-15411) for \$115,203. Expected contract execution date is 8-1-63. ✓
- 3. APOLLO: Interface Documentation Repository and Control - MSFC's repository function has been coordinated within MSFC and subsequently with LOC and MSC. Efforts are now underway to reconsider Center control functions. MSC believes Center control should be strengthened since this is a daily technical matter. OMSF wants to exercise this control through GE. (Kuo!) B
- * Panel Review Board - In preparation for Shea's first organizational meeting on 8-9-63, comments of all Panel Chairmen have been collected as a basis for an MSFC position for PRB Charter. Reservations have been expressed regarding a change from "review" to detail technical "control." ✓

B812

NOTES 7-29-63 MAUS

1. OMSF PROGRAM SCHEDULES - The revised draft manual on the OMSF Program Scheduling and Review Procedure includes only part of MSFC recommendations and does not afford the relief we had hoped for.

I have appointed J. N. Foster as MSFC representative to the new OMSF four-man Standing Committee to review and coordinate issuance of the new manual. Through this committee, we will try again to reach acceptance of balance of our recommendations. ✓

- gm
- * 2. VISIT TO AIR FORCE RESEARCH INSTALLATIONS - Reference your comment on 7-1-63 NOTES, copy attached. The visit by OMSF representatives to Air Force Research Installations was postponed; the date was not compatible with Capt. Freitag's schedule. Also, confusion resulted in headquarters after North Eastern Office heard of the planned visit and wanted to make a public announcement. Headquarters apparently decided that the timing was bad because of the current NASA survey in the Boston area to locate the proposed new Electronics Center. ✓

The MSFC Coordination Committee for Air Force Support is reviewing the tasks that have been proposed for accomplishment by the Air Force research divisions. We will brief you, prior to discussion of any of the proposed tasks with the coordinating board at AEDC. ✓

3. VALIDATION EXERCISE AND OVERALL MSFC MANAGEMENT SYSTEMS REVIEW - I will arrange for the principal representatives of Dr. Seamans in these two exercises, to give an in-between status report on their findings in the Board Meeting this week. ✓

4. DIVISION SURVEYS - Reference NOTES 7-8-63 Grau and NOTES 7-15-63 Geissler, copies attached. The Division Surveys are complete and all division directors have concurred in the proposed reorganizations. These reorganizations of the divisions will now be advanced in conjunction with the MSFC overall reorganization. ✓

3 Attachments

B012

1. CABLE INSULATION ON S-IV STAGE: Astrionics, Quality Assurance and this division propose that all engine cable trunks of the S-IV stage be insulated temporarily with asbestos tape covered by a layer of aluminum foil to provide fire protection. This results in an estimated 250 pounds additional weight and many clamps will have to be reinforced. We are giving technical information to Saturn Systems Office for official action to accomplish this proposal. ✓

2. MSFC REVIEW OF RIFT NINE-FOOT TANK: The MSFC review of the RIFT nine-foot tank LH₂ test program was held at Sunnyvale, California, 7-23/24-63. Government personnel attending included Keith Boyer (Director, J Division), Roy Reider (Safety Director), and C. A. Fenstermacher (Director, Test Cell A) from Los Alamos Scientific Laboratory (LASL). The LASL people were quite complimentary to Lockheed on the detail applied to test procedures and facility design. The nine-foot tank facility is located in the Lockheed, Santa Cruz, test area. Testing of the tank is scheduled to start this fall. ✓

* 3. OPERATING AGREEMENT BETWEEN MSFC/NAVY: The operating agreement between MSFC and Navy for use of Hangar No. 1 at Moffett Field, California, has been signed by MSFC. Navy signature was expected on 7-26/27-63. This will allow Lockheed to move in with initial phase of welding equipment for fabrication of structural panels. The move is scheduled to start 8-1-63. ✓

4. GEORGIA NUCLEAR LABORATORY (GNL): The Air Force has scheduled a Washington meeting with General Services Administration (GSA) and the Corps of Engineers on 7-30-63; reportedly to try to force GSA to immediately dispose of the Lockheed-operated Georgia Nuclear Laboratory for them. The GNL is currently operated under an interim extension of lease from the Corps of Engineers (agents for the Air Force). The MSFC position continues to be that GNL is needed for RIFT radiation testing and qualification. We hope that NASA Headquarters supports our position and expedites the transfer of GNL from the Air Force to the Atomic Energy Commission so there will be no interruption in operation. ✓

5. S-IVB DOUGLAS AIRCRAFT COMPANY (DAC) DOCUMENTATION: DAC has released approximately 30% of the S-IVB stage drawings. An end-item list required by contract has not yet been submitted to MSFC. A schedule of drawing release dates, requested through Saturn Systems Office, is still not available; and, according to Assembly Engineering Section personnel, DAC feels that it is their prerogative to change delivery date schedules without informing MSFC. ✓

6. SOLAR RADIATION SHIELDING REQUIRED FOR SATURN V TEST TOWER: Thermal analyses indicate that for long standing periods with holddown arms clamped into place the load platform and holddown arms must be shielded, but during normal static firing, allowable temperature variations will not be exceeded.

7. 150-POUND ENGINE FOR S-IV AUXILIARY PROPULSION SYSTEM: The Thompson Air Products engine was assembled improperly. Another engine of the same design and two of another concept were to be tested by cutoff date of 7-26-63. If these engines fail to meet requirements, DAC may select another contractor. ✓

8. DESIGN REVIEW OF THE NERVA REACTOR: This division is participating in a NERVA Reactor Design Review lasting six days at Westinghouse. ✓

W.M.
I thought
Seamans
had
provided
us lie
would
B

SAT
There
does
that
leave us
with
Brazierd
Holmes?
Unaccep-
table!
B

NOTES 7-29-63 RUDOLPH

B_{8/2}

No Notes.

B 8/2

NOTES 7-29-63 Stuhlinger

* 1. FY-1964 SUPPORTING RESEARCH AND TECHNOLOGY: We have
not yet received any official feedback from the FY-1964 MSFC Research
and Supporting Technology Program submission to NASA Headquarters.
The various MSFC tasks submitted are presently under consideration
by OART, OSS, OMSF, and OTDA. Previously, Dr. Bisplinghoff
estimated that Headquarters review and approval of the FY-1964
research tasks submitted by the Centers would be completed before
July 1. This was obviously an overly optimistic estimate because
of the vast amount of cross coordination that must be effected between
OART and the other Headquarters Program Offices under the new and
involved research task approval operation. At the present time we do
have ample funding to cover extensions of OART research contracts
expiring in the first quarter of FY-1964. FY-1964 program authority
has not, as yet, been provided to continue expiring OMSF research
and technology contracts. ✓

2. OFFICE OF APPLICATIONS: As of July 12, there had been requests
for 7,651 copies of "Selected Welding Techniques"; 3,000 copies were
sent to congressional committees, NASA distribution, research institutes,
etc. The distribution of the other copies resulted from individual
written requests.

Dr. Dornberger called Mr. Thompson and stated that in his opinion
this type of publication was very worthwhile. He also commented that
the welding developments reminded him of the first thrust chamber
developments at Peenemünde. ✓

3. METEOROID MEASUREMENT PROJECT: An in-house status
review of the Meteoroid Measurement Project was conducted at MSFC
on July 24. Each organizational element of MSFC was given the oppor-
tunity of presenting current status, and to delineate problem areas.
OART was represented and, therefore, obtained the latest status of
this project. The meeting enabled all supporting personnel to become
aware of existing problem areas, and to work together more closely
as a team. ✓

Harry G.

How about the famous continuing
resolution? Doesn't it apply in
this case?

off-and-on
business looks

small
research
contracts more
than anything
else.

B

* *I'm glad it did B* S-IVB Tooling Tower: Representatives of Douglas were in Huntsville on July 18 and 19, to negotiate an agreement for the S-IVB Tooling Towers at Huntington Beach. Your reaction to the letter from Mr. Able, dated July 9, apparently reached Mr. Able. Douglas agreed to fund through corporate means \$1.5M of the \$2.4M facility. The \$1.5M includes items which are clearly defined as facility type (structural steel, foundations, roofs, elevators, etc). The remainder will be Marshall funded and according to Major Barnett fits the definition of Special Tooling. These items are generally; Vapor Degreaser, De-ionized Water System, Work Platforms and the controlled environment for the Insulation Building. Douglas is scheduled to open competitive bids July 30 for the entire job. Since Marshall funding is for Special Tooling, notification to Mr. Webb and Congress is unnecessary. ✓✓

* *you* S-II: On July 26, authority and 1.4M dollars was provided the Navy for construction of the Vertical Assembly Building at Seal Beach. Headquarters approval required 19 days after the Lingle-Long report to Dr. Seamans. The General Accounting Office is doing a periodical audit of Southwest Bu-Docks, San Diego. We understand they are concerned about so much negotiated contracting at Seal Beach and will undoubtedly look closely at Murray Shiff. For your information, Murray Shiff has been awarded \$2.6M by competitive bids and \$4.4M by negotiated contracts. Change Orders have increased the Shiff total by \$1.5M. ✓

Mr. Long's visit: NASA Construction Advisor, Robert Long, visited Huntsville, Mississippi and Michoud during the week of July 15 for construction orientation in those areas. His reaction was generally favorable, except that he believes Boeing is not as capable as Chrysler in performing plant modifications. Mr. Long is a firm believer in the use of advanced planning and design funds. I expect his help in obtaining funds in these purposes. ✓

Mississippi Test Operations: As one means of reducing Mississippi Test facilities funding deficits and encouraging continued austerity, the Mobile District Engineer was asked to have all architectural-engineers review their MTO design for reduction or elimination of items which would result in lower costs without jeopardizing functional criteria. ✓

*1. F-1 ENGINE: Two engine tests were performed during this period. Testing on Test Stand 1B will be delayed another week for grouting of the flame deflector supports.

Eight injector development tests were conducted this period in the chamber-only stand. During the starting sequence of the last test, the main fuel valve (heavy ground equipment version) reportedly failed to properly open. This caused a series of explosions which did heavy damage to stand 1A and equipment. Estimated down-time is two months. A second test position which has been under buildup on this same stand was apparently less affected and could be in operation in less than half that time. This loss will hamper us relatively little with regard to the choice on an injector for the very first engine deliveries and PFRT. This choice has to be made now. Our work in search of a stable injector has produced the fact that the more stable versions, as we know them today, don't seem to deliver the specific impulse we need for our payload commitment (up to $\Delta I_{sp} = 10$ seconds or approximately 5,000#). This is based only on the relatively small total number of engine tests with the various injector versions which we have for comparison today. My recommendation here is to use, for MSFC's early test and cluster work, the safest injector we know: even though it falls short in performance. Then, let's use the remaining two years (until we have to commit hardware for #506) to go on vigorously in search of a better design. Many promising patterns and thoughts are in the early stages of preparation for later try-out. I hope that this approach meets your approval. H.W. *It does, absolutely! B*

2. F-1 EXTENSION SKIRT: (Reference NOTES 7-15-63 WEIDNER, paragraph 4, copy attached.) The development of the skirt up to now has had only secondary priority. This has been mainly due to the number of other formidable development problems we have been facing in the past. It was also felt that the delivery of a skirt as an independent item could, in principle, be delayed to a time point shortly prior to first cluster firing (or even first flight). This matter will get increasing attention now. We have two different approaches going in parallel: (a) a gas-cooled reusable version and (b) an ablative design (restricted to one-shot use). Either approach, in my opinion, could be made to work. The few early designs tested can stand a lot of improvement. We have made arrangements to bring the help of our experts to bear, especially towards the ablative approach, where our people have a lot of former nose cone experience to offer. We also are applying more pressure on Rocketdyne now for an increased effort.

*3. CONFERENCE ON LARGE ENGINES, OART: Outstanding fact was the scarcity of existing knowledge in the many areas of technology which are involved in the kind of propulsion system being discussed for our more advanced vehicles. We must choose our technology goals wisely and with moderation. The severity of our problems could fast be going far beyond what we can expect to be able to do within a reasonable time frame and within our means. It was concluded that for the purpose of defining areas of desirable OART propulsion technology efforts (under participation of MSFC), a hypothetical advanced engine should be specified. As detail results become available over the next years, one might then adapt some of the features or the degree of "advancement" accordingly. Only then would we be ready, with more confidence, to specify an item for actual development. *H.H. Koelle for info! B*